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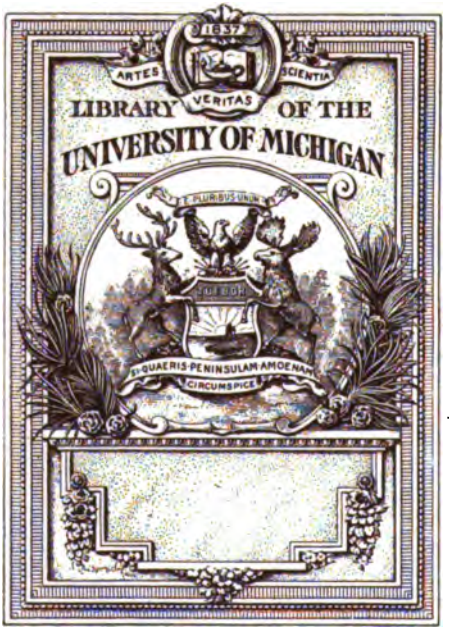

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"Going to the Fair."

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TRANSACTIONS

OF THE

WISCONSIN

State Agricultural Society,

INCLUDING THE

PROCEEDINGS OF THE STATE AGRICULTURAL CONVENTION HELD IN FEBRUARY, 1885, TOGETHER WITH OTHER PRACTICAL PAPERS.

VOL. XXIII.

PREPARED BY

CLINTON BABBITT, SECRETARY.

MADISON, WISCONSIN:
DEMOCRAT PRINTING COMPANY, STATE PRINTERS.
1885.

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THE TWENTY-THIRD ANNUAL REPORT OF THE SECRETARY OF THE WISCONSIN STATE AGRICULTURAL SOCIETY.

To his Excellency, JEREMIAH M. RUSK,

Governor of the State of Wisconsin.

Volume twenty-three of the Report of the Wisconsin State Agricultural Society for the years 1884 and 1885, together with those of the State Horticultural, Dairymen's and Agricultural Experiment Station, with grateful acknowledgments to the Law Makers of the State for their unanimous vote in favor of its publication, is most courteously submitted by the compiler.

CLINTON BABBITT,

Secretary.

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CHAPTER 194, LAWS 1885.

AN ACT making an annual appropriation to the State Agricultural Society, and providing for the compensation of county delegates to the state fair.

The people of the state of Wisconsin, represented in senate and assembly, do enact as follows:

SECTION 1. There is hereby annually appropriated to the Wisconsin State Agricultural Society, the sum of four thousand dollars. Provided that no warrant shall be drawn by the Secretary of State for the payment of the sum of money hereby appropriated, except upon the presentation of a sworn statement signed by the president and secretary of the said Wisconsin State Agricultural Society, certifying that the sale of intoxicating liquors has been prohibited and prevented upon the fair grounds of said society during the year for which the appropriation is made.

SECTION 2. It shall be the duty of the several agricultural societies entitled to the state aid of one hundred dollars in this state to send their president or other representative to the state fair where the annual election of officers is held, there to act on committees of award, and to cast the vote for the county in the aforesaid election.

SECTION 3. On the arrival of the president or other representative at the state fair, he shall report to the secretary thereof, and on the certificate of the secretary of his attendance and performance of the duties named in section 2 of this act, the treasurer shall pay him two dollars per day for the time he has been in attendance, not exceeding five days, and six cents per mile, one way, over the nearest traveled route from his home to the place where the state fair is held.

SECTION 4. This act shall take effect and be in force from and after its passage and publication.

Approved March 30, 1885.

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Group of Southdown Sheep. Property of C. S. Doe, Crystal Lake, Ills., from which the flock of Clinton Parrish, Beloit, are direct descendants.

OFFICERS OF THE SOCIETY, 1885.

BOARD OF AGRICULTURE.

President.

A. A. ARNOLD, GALESVILLE.
HON. N. D. FRATT, RACINE.
Last President of Wis. S. A. S.

Vice-Presidents.

C. L. MARTIN, JANESVILLE.
H. D. HITT, OAKFIELD.
MAT ANDERSON, CROSS PLAINS.
J. M. SMITH, GREEN BAY.
O. W. VAUGHN, LODI.
J. W. WOOD, BARABOO.
W. A. JOHNSTON, GALESVILLE.
ISAAC STEPHENSON, MARINETTE.

Secretary.

CLINTON BABBITT, BELOIT.
(*P. O. Address*—Wisconsin State Agricultural Rooms, Madison.)

Treasurer.

CYRUS MINER, JANESVILLE.

Additional Members of the Board.

ORRIS, PRATT, SPRING PRAIRIE.
WM. JACOBS, MADISON.
T. L. NEWTON, BEAVER DAM.
F. C. CURTIS, ROCKY RUN.
D. T. PILGRIM, WEST GRANVILLE.
GEO. B. SHAW, EAU CLAIRE.
A. LUDLOW, MONROE.
PROF. T. C. CHAMBERLAIN, BELOIT,
Pres. Wis. Academy Science, Arts and Letters.
E. A. BIRGE, MADISON,
Sec. Wis. Academy Science Arts and Letters.

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CONSTITUTION.

ARTICLE I.

OF THE NAME AND OBJECT OF THE SOCIETY.

This Society shall be known as the "Wisconsin State Agricultural Society." Its object shall be to promote the advancement of agriculture, horticulture, and the mechanical and household arts.

ARTICLE II.

OF THE MEMBERS.

The Society shall consist of life members, who shall pay, on subscribing, twenty dollars, and of honorary and corresponding members, who shall be elected by a two-thirds vote of all the members of the executive board, at any regular meeting. The presidents of county agricultural societies shall be members *ex-officio*, entitled to the same privileges as life members, and together, shall be known as the general committee of the Society.

ARTICLE III.

OF THE OFFICERS.

The officers of the Society shall consist of a president, one vice-president for each congressional district of the state, a secretary, a treasurer, and seven additional members, who shall hold their respective offices for a term of one year from the first day of January next succeeding the date of their election, and until their successors shall have been elected; and all of whom, together with the ex-president latest in office, and the president and general secretary of the Wisconsin Academy of Sciences, Arts and Letters, shall constitute the executive board.

ARTICLE IV.

OF THE POWERS AND DUTIES OF OFFICERS.

The presidents and vice-presidents shall perform such duties as are common to such officers in like associations, as may be required by the executive board.

The secretary shall keep the minutes of all meetings, and have immediate charge of the books, papers, library, and collections, and other property

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of the Society. He shall also attend to its correspondence, and prepare and superintend the publication of the annual report of the Society, required by law.

The treasurer shall keep the funds of the Society and disburse the same on the order of the president, or a vice-president, countersigned by the secretary, and shall make report of all receipts and expenditures at the regular meeting of the Society in December.

The executive board shall have power to make suitable by-laws to govern the action of the several members thereof. They shall have general charge of all the property and interests of the Society, and make such arrangements for the holding and management of general and special exhibitions as the welfare of the Society and the interests of industry shall seem to require.

The general committee shall be charged with the interests of the Society in the several counties where they respectively reside, and constitute a medium of communication between the executive board and the public at large.

ARTICLE V.

OF MEETINGS AND ELECTIONS.

The annual meeting of the Society for the transaction of general business, shall be held in its rooms in Madison, on the first Wednesday in December, at nine o'clock A. M., in each year, and ten days' notice thereof shall be given by the secretary, in one or more papers printed in the city of Madison.

The election of officers of the Society shall be held each year, during and at the general exhibition, and the exact time and place of the election shall be notified by the secretary in the official list of premiums, and in all the general programmes of the exhibition.

Special meetings of the Society will be called by order of the executive board, on giving twenty days' notice in at least three newspapers of general circulation in the state, of the time, place and object of such meetings.

At any and all meetings of the Society, ten members shall constitute a quorum for the transaction of business, though a less number may adjourn from time to time.

ARTICLE VI.

OF AMENDMENTS.

This constitution may be amended by a vote of two-thirds of the members attending any annual meeting; all amendments having been first submitted in writing at the previous annual meeting, recorded in the minutes of the proceedings, and read by the secretary in the next succeeding meeting for the election of officers. All amendments proposed shall be subject to amendment by a majority vote at the meeting when presented, but not thereafter.

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BY-LAWS.

SECTION I.

OF OFFICERS.

The officers of the society shall, *ex-officio*, fill the corresponding offices in the Executive committee.

SECTION II.

OF THE DUTIES AND POWERS OF OFFICERS.

The duties of the President, in addition to those defined by the constitution and the by-laws regulating the duties of the permanent committee, shall be as follows, to wit:

1. To inspect the fair grounds after they shall have been prepared for the annual exhibition by the special committee of arrangements, appointed for that purpose, and suggest such modifications or further preparations as he may deem necessary.

2. To formally open the annual fair of the Society at such time as the Executive committee may prescribe, with an appropriate address.

3. As the executive head of the Society, to have a general supervision and control of the entire exhibition, subject only to the authority of the Executive committee.

The duties of the Secretary, more especially defined than in the constitution, shall be as follows:

1. To make a faithful record of each meeting of the Executive committee and keep such record in a condition for the convenient reference of any member thereof, at any time; also to make a record of every order drawn on the treasurer, and deliver to parties in whose favor they were so drawn — separately entering and numbering the orders drawn to pay premiums and those to pay general expenses, and so defining them — and of all moneys due the Society; in all cases holding the parties so indebted responsible therefor until they shall have presented him a certificate from the treasurer, showing that the same has been paid.

2. To open and carry on such correspondence as may be advantageous to the Society or to the common cause of agriculture improvement, not only with individual agriculturists and eminent practical and scientific men of other industrial pursuits, but also with other societies or associations whose objects are kindred to ours, whether in this country or in foreign lands, and to preserve a journal of such correspondence in the archives of the Society.

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3. To collect and arrange for convenient examination, standard agricultural works and periodical publications, together with such models, machines and implements as may be donated to, or otherwise acquired by the Society.

4. To investigate, as far as practicable, the nature of fertilizers, indigenous and cultivated plants, insects injurious to vegetation, etc., and to collect and preserve such specimens thereof as will illustrate the natural history and agricultural resources, condition and progress of the state.

5. To institute, and collect reports therefrom, needed experiments relative to the preparation of the various soils of the state for economical culture, the cultivation of different grains, fruits and garden vegetables, the breeding and raising of stock, etc.

6. To visit, by the advice of the Executive committee, or as his own judgment may direct, the various portions of the state, and to give lectures on the science and practice of agriculture, wherever and whenever they may be deemed most necessary or desirable.

7. To co-operate with the superintendent of public instruction and the agent of the normal school board, for the introduction and use in the schools of Wisconsin, of standard works on agriculture and the other industrial arts and sciences.

8. To attend as many as possible of the industrial exhibitions of this country, particularly the county fairs of Wisconsin; to co-operate with the president and special committee of arrangements, for the judicious preparation and management of our state exhibition; and to have the sole supervision and control of the offices of entry thereat.

6. To carefully prepare and superintend the publication of the annual report of the Society to the governor of the state, embodying therein the proceedings of the State Agricultural Society, an abstract of the reports of the incorporated county agricultural societies of the state, and such reports, essays and addresses, or other matters of information, as may be calculated to enhance the value of said report.

Finally, it shall be his duty, not only by the means above named, but also through such other instrumentalities as he may devise, and the committee approve, to devote himself faithfully and unreservedly to the promotion of the industrial interests of the state.

It shall be the duty of the Treasurer—

1. To receive primarily and exclusively all moneys due the Society, from whatsoever source.

2. To keep a full and faithful record of all receipts of moneys coming into his hands, and of the sources whence derived, in a book specially furnished by and belonging to the Society, and to have the same open at all reasonable times, to the inspection of any person or persons authorized by the Executive committee to make such examination.

3. To likewise keep an exact record of every order by him paid; and such record must be verified by the proper vouchers, showing that the sums therein named have been by him so paid.

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SECTION III.

OF MEETINGS.

The Executive Committee shall meet annually, on the day preceding the day on which the annual meeting of the Society is held, on Monday preceding the first Tuesday of February, and again on the first day of the annual fair.

They shall also meet at the call of the secretary, the president and a vice-president of the society concurring—and may adjourn to any stated time.

SECTION

OF A QUORUM.

At any meeting of the Executive committee, four members thereof shall constitute a quorum for the transaction of business.

SECTION V.

OF PERMANENT COMMITTEES.

There shall be two permanent committees of the Executive committee, which shall be respectively styled the *Standing committee* and the *Finance committee.*

The Standing committee shall consist of the president, the secretary and treasurer, who shall have power in the recess of the Executive committee, to draw orders on the treasury for all necessary current incidental expenses. But the Executive committee shall have authority, and are hereby required to revise the proceedings or transactions of said Standing committee, and indorse or disapprove of the same.

The Finance committee shall consist of the president and treasurer, and it shall be their duty to suggest means for increasing the revenues of the Society.

They shall also have authority to invest any portion of the funds of the Society that may from time to time be set apart by the Executive committee for investment, disposing of such funds upon such terms and conditions as may be prescribed by the said Executive committee.

Each of the above named sub-committees shall be responsible for the faithful discharge of their duties to the Executive committee, to whom an appeal may at any time be taken from their acts or decisions.

The auditing, adjusting, allowing or rejecting of all bills, claims or demands, of whatsoever nature, against the Society, and the issuing of orders upon the treasurer for payment of the same — except for the current incidental expenses of the Society, as by this section already provided for — shall devolve upon the Executive committee, and it shall be the duty of said committee to annually examine the books, papers and vouchers of the

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treasurer and secretary, and compare the same, and adjust the accounts between those officers and the Society, and report thereon at the annual meeting in December.

SECTION VI.

OF THE ORDER OF BUSINESS.

The following order of business shall be observed at all the meetings of the Executive committee:

1. Reading the minutes of the preceding meeting.
2. Reading the minutes and reports of the Standing committee.
3. Reading the minutes and reports of the Finance committee.
4. Report of Auditing committee.
5. Reports from special committees.
6. Communication from the secretary.
7. Communications from members of the committees,
8. Unfinished business.
9. Miscellaneous business.

This order of business may be suspended, however, at any time, by a vote of the majority of the members present.

SECTION VII.

OF THE FISCAL YEAR.

The fiscal year of this Society shall commence on the first Wednesday of December in each year, and all annual reports of the year previous shall be made up to that time.

SECTION VIII.

OF THE EXPIRATION OF THE TERMS OF OFFICE.

The terms of office of all officers of this Society shall expire on the 31st day of December in each year.

SECTION IX.

OF AMENDMENTS.

These by-laws may be amended at any regular meeting of the Executive committee by a vote of eight of the members thereof.

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LIFE MEMBERS.

Names.	Residence.	Names.	Residence.
Adams, James	Janesville.	Boyce, A. A	Lodi.
Adams, L. L	Stoner's Prairie	Boyd, R. B	Milwaukee.
Alexander, O	Milwaukee.	Bowman, J. M	Madison.
Allen, J. W	Janesville.	Bradley, C. T	Milwaukee.
Allen, W. C	Delavan.	Braley, A. B	Madison.
Allen, H. M	Evansville.	Brazen, Benj	Wauwatosa.
Allis, Edward P	Milwaukee.	Brichener, G. H	Sheboygan F's
Anderson, Matt	Cross Plains.	Brabazon, J. R	Delavan.
Angell, R. R	Janesville.	Brockway, E. P	Milwaukee.
Angell, W. H	Sun Prairie.	Brodhead, E. H	Milwaukee.
Atkins, Albert R	Milwaukee.	Brown, Jas. J	Madison.
Atwood, David	Madison.	Brown, Jas. A	Milwaukee.
Atwood, Wm. T	Portland, Org.	Brown, Frank G	Madison.
Atwood, R. J	Madison.	Bruce, A. T	Madison.
Armour, P. D	Milwaukee.	Bryan, John	Cross Plains.
Armstrong, L. G	Boscobel.	Bryant, F. H	Madison.
Arnold, A. A	Galesville.	Bryant, D. D	Madison.
Aspinwall, D. M	Farmington.	Bryant, G. E	Madison.
Babbitt, A. O	Beloit.	Bryant, G. E., Jr.	Madison.
Billings, Carl	Madison.	Bull, Stephen	Racine.
Blossom, Levi	Milwaukee.	Bullard, James	Evansville.
Briggs, F	Madison.	Bump, N. P	Janesville.
Babbitt, Clinton	Beloit.	Bunker, Geo	Madison.
Babbitt, D. H	Auburn, N. Y.	Burgess, J. M	Janesville.
Bacon, I. P	Waunakee.	Bush, Samuel	Milwaukee.
Bacon, W. D	Waukesha.	Button, Henry H	Milwaukee.
Bailey, A. P	Oshkosh.	Burnham, Jr., A	Milwaukee.
Bailey, M. T	Madison.	Burnham, J. L	Milwaukee.
Barlass, Andrew	Emerald Grove	Burnham, Miles	Bl'ng Pr. Minn.
Barlass, David	Emerald Grove	Byrne, John A	Madison.
Barrows, E. S	Chicago.	Brand, F. C. G	Milwaukee.
Baxter, Geo	Windsor.	Carey, Ed. A	Fond du Lac.
Bates, A. C	Janesville.	Camp, H. H	Milwaukee.
Bement, E. R	Oregon.	Cantwell, M. J	Madison.
Bemis, Jervis	Footville.	Capron, Geo	Boston, Mass.
Benedict, J. D	Bristol.	Carleton, W. D	Sun Prairie.
Benedict, S. G	Providence, R.I.	Carpenter, J. A	Waukesha.
Benedict, W. G	Milwaukee.	Carpenter, J. E	Windsor.
Benson, S. W	Bloomfield.	Carpenter, J. H	Madison.
Biglow, F. G	Milwaukee.	Carpenter, S. D	Carthage, Mo.
Bliss, C. M	Kansas.	Carr, N. B	Madison.
Bird, I. W	Jefferson.	Carr, Joseph S	Eau Claire.
Bird, T. E	Madison.	Carter, A. M	Johnstown.
Bishop, J. C.	Fond du Lac.	Carver, P. S	Delavan.
Black, John	Milwaukee.	Case, J. I	Racine.
Blair, F. J	Milwaukee.	Clark, C. H	Madison.
Blanchar, Willard	Madison.	Clark, D. J	Milwaukee.
Bostwick, J. M	Janesville.	Chandler, J. C	Madison.
Bostwick, R. M	Janesville.	Chandler, S	Milwaukee.
Bonnell, James	Milwaukee.	Chapman, T. A	Milwaukee.
Bonnell, L	New York City	Chase, Enoch	Milwaukee.
Boorse, Henry	Granville.	Chase, H	Milwaukee.

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Names.	Residence.	Names.	Residence.
Cheney, Rufus.....	Evanston, Ill.	De Hart, J. L.....	West Lima.
Chipman, A.....	Sun Prairie.	De La Matyr, W. A.	Middleton.
Children, E.....	E. Dubuque, Ill	Delaplaine, G. P....	Madison.
Chipman, C. R.....	Waunakee.	De Mor, A. B.....	Chicago, Ill.
Church, W. W....	Topeka, Kas.	Dewey, Nelson.....	Cassville.
Clark, C. R.....	Madison.	De Wolf, E.....	Fitchb'rg, Mass
Church, Wm. A....	Milwaukee.	Devoe, A. B.....	McFarland.
Clapp, G. W.....	Oregon.	Dickerman, J. A...	Verona.
Clark, C. M.....	Whitewater.	Dodge, J. E.....	Lancaster.
Clark, Lewis.....	Beloit.	Dodge, H. S.....	Milwaukee.
Cochrane, John....	Waupun.	Doolittle, W. J.....	Janesville.
Coggswell, A. W...	Brookfield.	Dore, J. S.....	Neillsville.
Colby, Charles.....	Janesville.	Doris, John.....	Milwaukee.
Coleman, W. W....	Milwaukee.	Dorn, M. M.....	Madison.
Colman, Ed.....	Fond du Lac.	Dousman, T. C.....	Dousman.
Colladay, Wm. M..	Stoughton.	Dow, O. P.....	Palmyra.
Colton, John B.....	Madison.	Drakely, S.....	
Cooper, E. J.....	Des Moines, Ia.	Dunlap, S.....	Token Creek.
Cornell, James.....	Oakfield.	Durkee, H.....	Kenosha.
Cornwell, H. H....	Dakota.	Duthcer, J. A.....	Milwaukee.
Corrigan, John.....	Cedarburg.	Dwinnell, J. B.....	Lodi.
Cottrill, J. P. C....	Milwaukee.	Eaton, J. O.....	Lodi.
Cottrill, W. H.....	Appleton.	Echlin, J. C.....	Janesville.
Cottrill, C. M.....	Milwaukee.	Edgerton, E. W....	Milwaukee.
Crampton, N. B....	Madison.	Elderkin, Ed.....	Elkhorn.
Crawford, J. B....	De Smet, Dak.	Elliott, E.....	Santa Cruz, Cal
Crawl, John.....	Center.	Elliott, Jas. T.....	Racine.
Crilly, John J.....	Milwaukee.	Ellis, J. A.....	Chicago, Ill.
Crocker, Hans.....	Milwaukee.	Edmunds, F. W....	Madison.
Crosby, J. B.....	Janesville.	Ellsworth, L.....	Milwaukee.
Crossett, B. F.....	Janesville.	Ellsworth, W. J....	Madison.
Culver, Caleb E....	Shopiere.	Elmore, A. E.....	Green Bay.
Cummings, Wm...	Fitchburg.	Elmore, R. P.....	Milwaukee.
Curtis, F. C.....	Rocky Run.	Eldred, John.....	Milwaukee.
Curtis, D. W.....	Fort Atkinson.	Elson, Charles.....	Milwaukee.
Curtis, Dexter	Madison.	Emmons, N. J.....	Milwaukee.
Cutting, J. W.....	Harmony.	Enos, Elihu.....	Waukesha.
Coon, H. C.....	Albion.	Esterly, Geo. W....	Whitewater.
Cook, W. H.....	West Point.	Falk, Frank R.....	Milwaukee.
Crawford, E. B....		Farnsworth, J. H..	Fond du Lac.
Doyon, M. R.....	Madison.	Farwell, L. J.....	Chicago, Ill.
Dousman, H. L....	Pra. du Chien.	Fenn, G. W.....	Janesville.
Davis, Patrick	Verona.	Ferguson, D.....	Milwaukee.
Dexter, W. W.....	Janesville.	Ferguson, Benj....	Fox Lake.
Dahlman, Anthony.	Milwaukee.	Field, Martin	Mukwanago.
Dahlman, John....	Milwaukee.	Field, W. W.....	Odebolt, Ia.
Dann, Obed	Chicago, Ill.	Fifield, L.....	Janesville.
Danks, E. P.....	Stoughton.	Fifield, D. E.....	Janesville.
Daniels, W. W.....	Madison.	Fifield, E. G.....	Janesville.
Darling, K. A.....	Fond du Lac.	Finch, Lorin.....	Bradford.
Darwin, A. G.....	Brooklyn, N. Y.	Firmin, F. H.....	Hastings, Neb.
Daubner, Geo. H...	Brookfield, C.	Fisher, C. C.....	Center.
Davidson, Adam...	Verona.	Fischer, Elijah	Newark
Davis, N. P.....	Pierceville.	Fisher, Seth.....	Center.
Davis, W.....	Center.	Fitch, D.....	Madison.
Dean, E. B.....	Madison.	Fitch, W. F.....	Madison.
Dean, John S.....	Madison.	Fitch, W. G.....	Milwaukee.

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Fitzgerald. R. P....	Milwaukee.	Hancock, Brad....	Chicago.
Fletcher, John.....	Springfiel .	Hanks, A. S.....	Milwaukee.
Flint, J. G., Jr.. ..	Milwaukee.	Hammond, L. M..	Janesville.
Folds, Geo. H.....	Sioux Falls.	Hammond, E. S..	Fond du Lac.
Foot, E. A.....	Footville.	Harrington, N. M.	Delavan.
Foot, H. E.....	Milwaukee.	Harris, Jas.....	Janesville.
Ford, J. C.....	Madison.	Harvey, J. N.....	Kn'xville, Tenn
Fowler, James S...	Milwaukee.	Hasbrouck, W....	Eau Claire.
Fox, A. O.....	Oregon.	Hastings. S. D....	Madison.
Fratt, N. D.....	Racine.	Hausman, Jos....	Madison.
Frank, A. S.....	Oregon.	Hawes, J. T.....	Wil'wLake,Da.
Frank, Geo. R.....	Boscobel.	Hawes, W. N.....	East Middleton
Frankfurth, Wm...	Milwaukee.	Hayes, A. J.....	Milwaukee.
Freeman, C. F.....	Milwaukee.	Hazelton, Geo. C.	Boscobel.
Friedman, Ignatius	Milwaukee.	Hazen, Chester ...	Ladoga.
French, Jonathan..	Madison.	Helmer, A. M....	Waukesha.
Fuller, M. E.....	Madison.	Hempsted, H. N..	Milwaukee.
Fuller, F. D.....	Madison.	Hicks, J. H.....	Oshkosh.
Fuller, E. M.....	Madison.	Hibbard, W. D...	Milwaukee.
Furlong, John	Milwaukee.	Hibbard, W. B...	Milwaukee.
		Higby, A. T.....	Ft. Atkinson.
Gates, D. W. C....	Madison.	Hill, H. J.....	Madison.
Galbraith, Jas.....	Janesville.	Hill, J. P. W.....	Belleville.
Gammons, Warren.	Middleton.....	Hill, Robert	Chicago.
Gaylord, Aug.....	New York.	Hill, J. H.	Madison.
Gernon. Geo.....	Madison.	Hinckley, B. R...	Summit.
Gibbs, Chas. R.....	Whitewater.	Hitt, H. D.....	Oakfield.
Gilbert. Thos.....	Oregon.	Hodson, C. N.....	Janesvil'e.
Giles, H. H...	Madison.	Hoeflinger, Carl...	Wausau.
Gilman, H.....	Burke.	Hogan, Gilbert ...	E eria, O.
Gleason. H. B.....	Madison.	Holister, R. M....	Dakota.
Goodenow, H. D...	Madison.	Holmes, A. M.....	Milwaukee.
Goodrich, Ezra.....	Milton.	Holton, Edward D	Milwaukee.
Gould, L. D.....	Madison.	Hoven, Matt.....	Madison.
Grady, F. M.....	Madison.	Hopkins, B. B....	Milwaukee.
Graham, Alex....	CedarRapids,Ia	Hopkins, E. E ...	Milwaukee.
Grant, Albert.....	Milwaukee.	Hopkins, James...	
Graves, R. T.....	Ripon.	Hoskins, J. W....	Milwaukee.
Graves, S. W.....	Rutland.	Hoskins, Alfred...	Janesville.
Green, Geo. G.....	Milwaukee.	Hoyt, J. W.....	Madison.
Green, Richard	Middleton.	Hoyt, F. E.....	Rochester.
Green, N. S.....	Milford.	Hurlbut, E.....	Oconomowoc.
Greenleaf, E. B....	Milwaukee.	Hume, Wm.....	Oshkosh.
Greenman, C. H....	Dov'rCen.,Min.	Hutchins. C. A...	Fond du Lac.
Greenman, H. D...	Milwaukee.	Hutson, J. S.....	Stoughton.
Gregory, J. C.....	Madison.	Hudson, John ...	Madison.
Grinnell, J. G.....		Huntley, D.....	Appleton.
Groom, J.....	Madison.	Hyde, Edwin	Milwaukee.
Grubb, W. S.....	Baraboo.		
Gurnee, J. D.....	Madison.	Ilsley. Chas. F....	Milwaukee.
		Inbush, J. H.....	Milwaukee.
Haight, Nicholas...	Madison.	Ingram, A. C.....	New York.
Haight, J. M.....	Sacram'nto,Cal		
Hall, Augustus....	Janesville.	Jacobs, Wm.....	Madison.
Hallock, Youngs...	Middleton.	Jackman. Hiram..	Chicago.
Hall, H. P.....	Boston.	Jeffery, Geo.....	Milwaukee.
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Hanchett, A. M ...	Milwaukee.	Johnston, W. A...	Galesville.

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Johnson, M. B.....	Chicago.	Lysaght, Wm.....	Monroe.
Johnson, Joseph..	Hartland.	Leslie, John	Madison.
Johnson, John V...	Milwaukee.		
Johnson, John A...	Madison.		
Johnson, Hugh L.	Milwaukee.	Mann, J. E.....	Sun Prairie.
Johnson, John....	Milwaukee.	Main, Alexander H.	Madison.
Jones, E. D.....	Fond du Lac.	Mann, A. L.....	Madison.
Jones, C. H.....	Sun Prairie.	Mann, Henry.....	Sun Prairie.
Jones, John N.....	Madison.	Mann, Curtis	Oconomowoc.
		Manwaring, Wm...	Black Earth.
Kellogg, Geo. J	Janesville.	Marshall, Samuel ..	Milwaukee.
Keiwert, Emil.....	Milwaukee.	Martin, A. C.....	Ashton.
Kent, A. C.....	Janesville.	Martin, C. L	Janesville.
Kershaw, C. J	Milwaukee.	Martin, Nathaniel..	Monroe.
Keyes, E. W.....	Madison.	Martin, S. W	Madison.
Kimball, M. G	Sheboygan.	Mason, Geo. A.....	Chicago.
Kingsley, Geo. P...	Springfield.	Mathews, A. R....	Milwaukee.
Kingston, J. T	Necedah.	Maxson, O. T	Evanston, Ill.
Kiser, W. C.....	Tetonka, D. T.	May, A. C	Milwaukee.
Kiser, J. C.....	Oregon.	Mayhew, T. W.....	Milwaukee.
Klauber, Samuel...	Madison.	Mayhew, F. L.....	Milwaukee.
Knight, E	Myrtle, Dakota.	Mayhew, J. L.....	Milwaukee.
Kneeland, James ..	Milwaukee.	McCarty, F D.....	San Francisco.
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Knowles, Geo.....	Milwaukee.	McConnell, Wm. N.	Dartford.
Knapp, G. A.....	Fond du Lac.	McConnell, T. J....	Madison.
Knapp, J. G	Tampa, Florida.	McCormick, J. G...	Madison.
Knapp, Wm. A	Fond du Lac.	McDermott, Wm ..	Fond du Lac.
Koss, Rudolph.....	Milwaukee.	McDonald, A	Alica.
		McDonald, J. S	Fond du Lac.
Ladd, M. L	Mendota, Ill.	McDowell, H. C....	Oconomowoc.
Lamb, F. J	Madison.	McGeogh, P	Milwaukee.
Landauer, Max	Milwaukee.	McIndoe, N. D.....	Wausau.
Lapham, Henry....	Summit.	McKenna, Martin..	Madison.
Larkin, B. F.....	Madison.	McLaren, Wm. P..	Milwaukee.
Larkin, C. H.....	Milwaukee.	McNeil, David	Stoughton.
Larkin, Daniel.....	Madison.	McPherson, J. P...	Springdale.
Larkin, Wm.....	Madison.	Merrill, Alf	Madison.
Lawrence, W. A...	Janesville.	Miller, C. B.....	Madison.
Lawton, J. G	De Pere.	Miller, John	Madison.
Lazier, Ed....	Madison.	Millett, Chas. O	Beloit.
Learned, J. M.....	California.	Mills, Simeon.....	Madison.
Leidersdorf, B.....	Milwaukee.	Miner, Cyrus.....	Janesville.
Leitch, W. T.....	Brooklyn, N. Y.	Miner, John B	Milwaukee.
Leitch, Jr., W. T ..	Vienna.	Mitchell, Alex	Milwaukee.
Lester, Waterman.	Janesville.	Mitchell, J. L.....	Milwaukee.
Lewis, John L	Madison.	Moore, B. F.....	Fond du Lac.
Lindsay, E. J	Milwaukee.	Morden, E.....	Madison.
Lloyd, Lewis.....	Cambria.	Morehouse, L. H...	Milwaukee.
Lockin, John	Pueblo, Col.	Morrison, W. H....	Elkhorn.
Lockwood, John...	New Orleans.	Mosely, J. E	Madison.
Ludington, H.....	Milwaukee.	Moxley, A. R	
Ludington, James .	Milwaukee.	Mullen, James.....	Chicago.
Ludlow, A..... ...	Monroe.	Murray, Geo.....	Racine.

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Nason, S. L.	Nasonville.	Pratt. E. E.	Chicago.
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Nazro, John	Milwaukee.	Pritchard, P. M	Fitchburg.
Needham, E. G	Elm Grove.	Pratt, Orris	Spring Prairie.
Newcomb, S. B.	Cold Spring.	Power, D. J.	Chicago.
Newton, J. S.	Middleton.		
Nicholas, L. T	Janesville.		
Norris, C. W.	Milwaukee.	Ray, Chas	Milwaukee.
Norton, J. B.	Madison.	Raymond, S. O	Geneva.
Nowell, W. A.	Milwaukee.	Riordan, Chas	Oshkosh.
Nelson, C. B.	Madison.	Reed, Harrison	Jacksonv'l, Fla.
Newton, T. L	Beaver Dam.	Ressigue, A. C.	Janesville.
		Reynolds, Thos	Madison.
Ober, R. P	Milwaukee.	Reynolds, John	Kenosha.
Ogilvie, Robert	Madison.	Rexford, J. D.	Janesville.
Olcott, J. B	Oshkosh.	Rice, E. M.	Whitewater.
Oliver, Joseph B.	Milwaukee.	Richards, Richard.	Racine.
Olney, C. W.	La Cygne, Kan.	Richardson, D	Middleton.
Orr, G. H.	Verona.	Richardson, Jas.	Buffalo, N. Y.
Ott, Geo. V.	Lawtey, Fla.	Richardson, R. J	Janesville.
		Richardson, H	Janesville.
Page, H. M	Baraboo.	Richmond, A	Whitewater.
Palmer, H. L	Milwaukee.	Riebsam, C. R	Madison.
Palmer, J. Y.	Oregon.	Robbins, J. V.	New York.
Palmer, O. M	Oregon.	Rodgers, L	Westport.
Palmer, Henry	Oregon.	Roe, J. P.	Franklin.
Park, Wm. J	Madison.	Rogers, C. H	Milwaukee.
Parker, C. H.	Beloit.	Rodgers, D. J	Milwaukee.
Parmley, Ira	Center.	Rogers, J. S.	Burlington.
Parsons, P. B.	Denver, Col.	Rogers, Anson	Janesville.
Paul, John H	Genesee.	Rogers, H. G.	Milwaukee.
Partridge, J. S	Whitewater.	Rowe, Rich'd W	Madison.
Patten, L. F	Janesville.	Rowe, W. E	Arena.
Patton, Jas. E	Milwaukee.	Ruggles, J. D	San Francisco.
Paul, Geo. H	Milwaukee.	Ryder, James K.	Waterloo.
Payne, Wm	Janesville.	Rawson, C. A.	Madison.
Payne, H. C	Milwaukee.		
Peffer, G. P.	Pewaukee.	Shaw, Geo. B	Eau Claire.
Pember, R. T	Janesville.	Sherman, Amaziah	La Prairie.
Perkins, P. M.	Burlington.	Stevens, J. T.	Madison.
Perrine, L. W.	Janesville.	Sherman, Adelmer	La Prairie.
Perry, B. F	Madison.	Stanley, Wm	Vienna.
Pfister, Guido	Milwaukee.	Sprecher, John	Madison.
Phelps, A. Warren.	Milwaukee.	Sage, E. C.	Faulkton, D. T.
Pier, C. K	Fond du Lac.	Salisbury, R. W	Fitchburg.
Pierce, C. L.	Milwaukee.	Salisbury, D. F.	Fitchburg.
Pilgrim, D. T	West Granville	Sanderson, Ed	Milwaukee.
Page, H. L	Milwaukee.	Sanderson, R. B.	Madison.
Palmer, E. W.	Madison.	Sarles, John H.	Boscobel.
Pinney, S. U.	Madison.	Schute, Charles	Milwaukee.
Plankinton, John	Milwaukee.	Schutt, U	Janesville.
Plumb, J. C	Milton.	Seville, James	Lodi.
Plumb, T. D	Madison.	Sexton, W. F	Milwaukee.
Plummer, B. C	Wausau.	Simmons, C. J	Monroe.
Pond, Samuel A	Janesville.	Sharp, J. W	Iowa.
Porter, Wm. H	Marshall.	Shaw, J. B	Milwaukee.
Porter, G. E	Eau Claire.	Sheldon, A. H.	Janesville.
Powers, W. J	Black Earth.	Sheldon, D. G.	Madison.

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Sheldon, S. L.....	Madison.	Twining, M. S. ...	Broadhead.
Shepard, C	Milwaukee.		
Sherwood, J. C	Dartford.	Van Brunt, W. A..	Horicon.
Shipman, S. V	Chicago.	Van Cott, Albert B.	Madison.
Skelley, Charles ...	Janesville.	Van Etta, Jacob..	Madison.
Skinner, Geo. J	Sioux F'ls, Dak.	Van Kirk, N.....	Milwaukee.
Skinner, E. W	Sioux City, Ia.	Van Schaick, J. W	Milwaukee.
Sloan, I. C.....	Madison.	Van Slyke, N. B..	Madison.
Slocum, J. A	Chicago.	Vaughn, O. W....	Lodi.
Smith, Winfield ...	Milwaukee.	Viall, Andrus.....	Madison.
Smith, Argus.....	Milwaukee.	Vil s, Chas. H....	Chicago.
Smith, H. L.....	Janesville.	Vilas, L. M.....	Eau Claire.
Smith, M. C.....	Janesville.	Vilas, Wm. F.....	Madison.
Smith, S. B	Verona.		
Smith, J. Maurice..	Chicago.	Ward, A. J.....	Madison.
Smith, J. M.....	Green Bay.	Waggstaff. S.....	Oshkosh.
Snell, H.....	Madison.	Wackerhagen, E..	Racine.
Stickney, J. S.....	Wauwatosa.	Wait, J. B.....	Waitsville.
Spencer, James C ..	Milwaukee.	Warren, Albert...	Madison.
Spencer, R. C	Milwaukee.	Warren, J. H.....	Janesville.
Squier, Thomas H..	Waterloo.	Welch, W.....	Madison.
Stannard, A. C....	Milton.	Wells, Daniel L..	Milwaukee.
Stark, Chas. A.....	Milwaukee.	Werner, John.....	Sauk.
Steele, Chester.....	Milwaukee.	West, Henry... ..	Madison.
Stevenson, Isaac ...	Marinette.	West, S. C.....	Milwaukee.
Steensland, H.....	Madison.	West, Henry M...	Milwaukee.
Stewart, C. R.....	Karson, Minn.	Whaling, J. W. M.	Waukesha.
Stewart, G. H.....	Col. Spr'gs, Col.	Wheeler, G-o. F..	Milwaukee.
Stilson, Edgar	Oshkosh.	Wheeler, Guy.....	La Prairie.
Stilson, Adelbert...	Oshkosh.	Wheeler, L. A.....	Milwaukee.
St. John, J. W.....	Janesville.	Wheelock, W. G..	Janesville.
Stockman, John....	Milton Junct'n.	Wheelwright, J...	Middleton.
Stone, Gustavus...	Beloit.	Whitney, W. F....	Milwaukee.
Storm, Wm.....	Madison.	Wicks, Thomas...	Milwaukee.
Stowe, LaFayette..	Sun Prairie.	Wight, O. W.....	Detroit.
Street, Richard	Waukesha.	Wightman, H.....	Black Earth.
Sutherland, C.....	Syene.	Wilcox, C. T.....	Janesville.
Swain, Wm. W....	Madison.	Wilkins, A. W....	Milwaukee.
		Wiley, O. S.....	Benn Har. Mich
Tallman, W. H.....	Janesville.	Williams, C. H....	Baraboo.
Taylor, E. T	Mukwanago.	Williams, D.....	Darien.
Taylor, W. R.....	Cottage Grove.	Williams, Daniel..	Summit.
Tenney, H. A.....	Madison.	Williams, J. P.....	Janesville.
Tenney, D. K.....	Madison.	Williams, G. G....	Whitewater.
Tenney, Samuel....	Hartland.	Williams, Randall.	Janesville.
Terwilliger, Jas....	Syene.	Williams, S. B....	Madison.
Thorson, John	Milwaukee.	Wilson, Wm.....	Westport.
Tibbits, Geo. M....	Milwaukee.	Wilson, Zebina....	Palmyra.
Tierney, K.....	California.	Wood, J. W.....	Baraboo.
Thompson, W. H ..	Chicago.	Wootton, Robert..	Madison.
Thorp, J. G	Eau Claire.	Worthington, B. M.	Madison.
Todd, J. G.....	Janesville.	Wright, D. H.....	Madison.
Tolford, J. W.....	Neillsville.	Wright, Geo	Mt. Horeb.
Torgerson, Lars....	Madison.	Wright, J. S.....	Emerald Grove
Torrey, R. D.....	Racine.	Wright, Josiah T..	Janesville.
Townley, John.....	Moundville.	Wylie, Geo. W....	Elkhorn.
Treat, R. B	Chicago.		
Treat, George E....	Milwaukee.	Zweitusch, Otto...	Milwaukee.

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Timothy Brown,
James Barry,
Fred. Bemis,
W. G. Beecroft,
George Barnes,
A. A. Bennett,
H. M. Billings,
Perry Bostwick,
W. A. Briard,
B. F. Brown,
H. D. Barron,
J. B. Bowen,
Guy Carter.
Wm. Casar,
C. M. Campbell,
C. B. Chapman,
John Child,
D. R. Coit,
B. F. Catlin,
A. J. Craig,
J. B. Crass,
Satterlee Clark,
L. S. Curtiss,
Seymour Curtiss,
J. Cary.
G. L. Davis,
S. B. Davis,
S. S. Daggett,
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J. B. Dousman,
Andrew Dunn,
J. P. Dickson,
Wm. Dunn,
E. W. Drury,
Abel Dunning,
Chas. Durkee,
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Sidney Foote,
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W. H. Fox,
John Fernley,
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Samuel Green,
Anthony Green,
Eleazer Grover,
Joseph Goodrich,
G. Goodrich,
Orrin Guernsey,
R. E. Gillett,

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J. C. Johnson,
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Moses Kneeland,
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L. H. Kellogg,
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Alex. McBride,
A. S. McDill,
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Wm. A. Mears,
Ira Miltmore,
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N. C. Rowley,
Simon Ruble,
Jas. H. Rogers,
R. Roddis,
Jas. Ross,
Harvey G. Russell,
Wm. B. Slaughter,
Jas. Sullivan,
Geo. B. Smith,
Frank Scollan,
L. Sexton,
M. Spaulding,
A. C. Shipman,
Kellogg Sexton,
J. M. Sherman,
Joseph Spaulding,
Geo. C. Stevens,
S. B. Scott,
W. E. Smith,
H. P. Strong,
Adam Smith,
J. B. Smith.
S. W. Smith,
Wm. Spaulding,
Geo. Sherman,
Jeff. Sinclair,
Geo. H. Slaughter,
Wm. Thompson,
John J. Talmadge,
M. J. Thomas,
Ole Thompson,
B. Troop.
W. H. True,
A. H. Terry,
Joseph Utter,
L. B. Vilas,
Henry Vilas,
A. H. Van Norstrand,
E. B. Wolcott,
J. F. Willard,
Dennis Worthington,
Charles Weed,
C. L. Williams,
Wm. A. White,
Jas. A. Webb,
A. White.
T. L. Whittlesey,
H. O. Wilson,
N. A. Wright,
W. R. Warren,
James Webster,
S. G. Williams,
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J. F. Woolley,
Martin Webster,
Wm. A. Wheeler,
A. H. West,
J. E. Young.

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LAW AUTHORIZING PUBLICATION OF TRANSACTIONS.

Sections 7, 8 and 9, of chapter 320, of the Laws of Wisconsin, give the following rules for the publication and distribution of the reports of the State Agricultural, Horticultural and Dairymen's Associations, and of the Agricultural Experimental Station of the State University:

SECTION 7. There shall be printed annually by the state printer, and on the order of the commissioner of public printing the following documents:

1. Thirteen thousand copies of the transactions of the Wisconsin State Agricultural Society, together with abstracts of the reports of the county and other agricultural societies and such other matter pertaining to the industry of the state as shall be deemed important; provided, the number of pages shall not exceed five hundred.

2. Sixteen thousand five hundred copies of the transactions of the Wisconsin State Horticultural Society, together with such abstracts of reports of county and other horticultural societies, and such other matters pertaining to fruit growing and other horticultural interests of the state as shall be deemed important; provided, the number of pages shall not exceed three hundred.

3. Eighteen thousand copies of the transactions of the State Dairymen's Association, and such other matters pertaining to the dairy interests of the state as shall be deemed most important; provided, the number of pages shall not exceed two hundred and fifty.

4. Eighteen thousand copies of the report of the Agricultural Experiment Station of the State University; provided, the number of pages shall not exceed two hundred.

SECTION 8. Thirteen thousand volumes of said report shall be bound in cloth, uniform in style with volumes previously published, each volume to contain such part of one copy of each of the reports designated in the preceding section, as the compiler shall select, the size of said joint report not to exceed one thousand pages; and shall be distributed as follows: Thirty copies to each member of the legislature; one hundred copies to the State Historical Society; twenty-five copies to each county agricultural society and district industrial association which embraces two or more counties, and furnishes the State Agricultural Society a report of its proceedings; one hundred copies to the State Horticultural Society; thirty

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copies to each county horticultural society; two hundred copies to the State Dairymen's Association; one hundred copies to the Experiment Station of the State University; twenty-five copies to the library of the State University; five copies to the Wisconsin Humane Society. To the governor, lieutenant-governor, secretary of state, state treasurer, attorney-general, state superintendent of public instruction, railroad and insurance commissioners, twenty-five copies each; to each public library in the state two copies; and the remaining copies to the State Agricultural Society for distribution by its secretary.

SECTION 9. Twenty-five hundred copies of the transactions of the State Horticultural Society shall be bound singly in cloth, and one thousand in paper. Twenty-five hundred copies of the State Dairymen's Association shall be bound in cloth and twenty-five hundred in paper. Twenty-five hundred copies of the report of the Agricultural Experiment Station of the State University shall be bound in cloth, and twenty-five hundred in paper, for the use of these several societies and departments for distribution or exchange.

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MINUTES

OF THE MEETINGS OF THE

Wisconsin State Agricultural Society

DECEMBER MEETING.

STATE AGRICULTURAL ROOMS,
MADISON, WIS., December 3, 1884.

In pursuance of the by-laws, the executive board of the Wisconsin State Agricultural Society met in the rooms of the Society, December 3, 1884, at 9:45 A. M. The meeting was called to order by the chair. It was stated that the object of the meeting was to receive the report of Cyrus Miner, treasurer of the society, showing the financial exhibit of the society, for the fiscal year ending December 2, 1884.

On motion of Clinton Babbitt, secretary, the meeting adjourned to December 16, 1884, in order to give the treasurer time to recover from a severe accident, who at that date it was hoped would be able to be present.

STATE AGRICULTURAL ROOMS,
MADISON, WIS., Tuesday, Dec. 16, 1884.

The executive board of the Wisconsin State Agricultural Society met in the rooms of the society, at 9 A. M., as required by the by-laws.

In the absence of President Fratt, who had been empaneled as juror, in Milwaukee, Gen. Geo. E. Bryant occupied the chair and called the meeting to order.

On motion of Hon. John A. Johnson, the meeting adjourned until Wednesday morning, the 17th inst., at 9 A. M.

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STATE AGRICULTURAL ROOMS,
MADISON, December 17, 1884.

The adjourned annual meeting of the Wisconsin State Agricultural Society was held in the rooms in the capitol at 9 A. M.

In the absence of President Fratt, General Mills moved that Dr. Jacobs occupy the chair.

Secretary Babbitt read a letter from President Fratt accounting for his absence.

Treasurer Miner read his report for the year 1884.

The Chairman appointed General Bryant, General Mills and M. R. Doyon a committee to examine the reports of the Treasurer and compare them with the books and vouchers of the Secretary and General Keyes and W. J. Ellsworth committee to examine accounts and vouchers of the Secretary.

Committee on Secretary and Treasurer's reports reported as follows:

The committee appointed to examine the Secretary's warrants and compare them with the vouchers report the same correct.

E. W. KEYES,
W. J. ELLSWORTH,
Committee.

Dated December 17, 1884.

The committee appointed to examine the vouchers of the Treasurer and compare them with the books of the Secretary, report the same correct.

GEO. E. BRYANT,
SIMEON MILLS,
M. R. DOYON.

Dated December 17, 1884.

On motion of M. M. Dorn the reports of the committees were accepted.

On motion of General Mills the meeting adjourned.

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TREASURER'S REPORT.

To the Officers and Members of the Wisconsin State Agricultural Society:

GENTLEMEN — I hand you herewith report of the financial transactions of the year ending December 3, 1884.

Respectfully submitted,

CYRUS MINER,
Treasurer.

AGRICULTURAL ROOMS, MADISON, December 16, 1884.

RECEIPTS.

Cash balance on hand	$3,012 01
Received from state appropriation	2,000 00
Received from sale of tickets	10,392 00
Received from Madison subscription	2,000 00
Received from rent of grounds	2,138 85
Received from secretary	1,288 62
Received from secretary for advertising	100 00
Received from secretary for sale of forage	88 14
Received from R. B. Ogilvie, stall rent	237 00
	$21,251 62

DISBURSEMENTS.

Paid premiums	$7,088 47
Paid superintendents and assistants	1,065 08
Paid marshals, assistants, police and gates	400 25
Paid incidental expense of board	366 81
Paid freight, express, telegraph, telephone	293 90
Paid material and labor	2,317 69
Paid printing and advertising	789 10
Paid secretary's salary, $1,650; clerks, $674	2,324 66
Paid asst. treas., treasurer's clerks	148 64
Paid hay, straw and grain	548 95
Paid interest, $210; reporter, $135; music, $160	505 00
Paid livery, $183.60; Tenney & Bashford, $150	333 60
Paid road machine, $131; museum, $30	161 00
Paid water supply 1883–1884	236 81
Paid National Association, $56; herd books, $51.50	107 50
Paid dinner tickets 1883, $55.66; 1884, $204.16	259 82
Paid miscellaneous, including orders Nos. 16, 54, 66, 256, 261, 351, 554, 577, 632	79 15
Paid orders 1883	156 75
Total amount disbursed	$17,133 18

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DETAILED STATEMENT OF EXPENDITURES, AS COMPARED WITH WARRANT ACCOUNT OF SECRETARY.

No.	*To whom and for what paid.*	*Amount.*
1	Miner, Cyrus, expenses and sundries	$5 60
2	Newton, Theodore, entry clerk–1883	12 00
3	Patterson, Etta, forty-six half days work	23 00
4	Newton, T. L., superintendent 1883	68 00
5	Dodd, H. B., express	1 50
6	Dunlap, S., police 1883	8 00
7	Frank & Ramsey, Hardware, etc	101 08
8	Miner, Floy, treasurer's clerk	20 00
9	Regan, Thos., water-works 1883	101 81
10	Bunker & Vroman, lumber 1883	319 94
11	Bryant, Gen. Geo. E., herd books	37 50
12	Dodd, H. B., express	70
13	Democrat Printing Co., printing	5 00
14	Stroup, Uriah, premium	10 00
15	Gordon, L. A., looking glass, Fair 1883	2 25
16	Waltzinger, A. F., 3 flags, track	50
17	Sheldon, S. L.	104 00
18	Eastman, John, work on fair grounds	50 00
19	Horn, Fred W., subscription	5 00
20	Grady, F. M., straw for 1883	5 00
21	Vail, Thos. J., out-fit of 1883	6 25
22	Sprecher, John, hay	7 12
23	Blackman, C. M., interest on loan	210 00
24	Martin, C. L., premium	12 00
25	Eastman, John, sundries	4 00
26	Edwards, Ira C., subscription	2 00
27	Babbitt, C., salary	150 00
28	Dodd, H. B., express	2 55
29	Fauerbach, C., express	2 55
30	Western Union Telegraph Co, dispatches	2 40
31	Western Union Telegraph Co., dispatches	90
32	Wise, Geo. W., premium	5 00
33	Wells, W. L., running race 1883	30 00
34	Hicks, J. H., expense at board meeting	12 50
35	Pratt, Orris, expense at board meeting	8 00
36	Pilgrim, D. T., expense at board meeting	12 50
37	Martin, C. L., expense at board meeting	10 00
38	Johnson, W. A., expense at board meeting	14 80
39	Arnold, A. A., expense at board meeting	14 80
40	Miner, Cyrus, expense at board meeting	10 17
41	Newton, T. L., expense at State Fair and board meeting	67 34
42	Smith, J. M., expense at board meeting	20 00
43	Davidson, A. L., reporting meeting	35 00
44	Peffer, G. P., silver plate bal	1 80
45	Patterson, Etta, clerk	25 00
46	Babbitt, C., salary on acct	150 00
47	Cunningham, Chas., hay	7 29
48	Cantwell, M. J., printing	180 60
49	Fuller, Frank, office work	3 00
50	Eastman, John, work at fair grounds	25 00
51	American Express Co., medals, C. O. D.	35 75
52	Avery, A. A., assistant superintendent machinery dep't	20 00
53	Edson, E. W., distributing supplements	60
54	Sentinel Pub. Co., subscription	10 00
55	Park Hotel, Whitney's bill	3 25
56	Tenney & Bashford, attorneys	150 00
57	Patterson, Mary, clerk	25 00

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No.	To whom and for what paid.	Amount.
58	Dodd, Agt., H. B., express	$1 40
59	Davison, A. L., short-hand report	100 00
60	Western Union Telegraph Co., telegrams	1 00
61	Babbitt, C,, salary	150 00
62	Dodge, Hattie E., premium, Dept. K	23 00
63	Harper, John, hay	2 90
64	Ogilvie, S. I., mdse of R. B. Ogilvie	78 73
65	Eastman, John, work on fair grounds	25 00
66	De Wolf, J., framing picture	5 35
67	Patterson, Mary, clerk	25 00
68	Babbitt, Clinton, salary	150 00
69	Dodd, Agt., H. B., express	4 65
70	Cook, Geo. R., engraving medals	8 85
71	Western Union Telegraph Co., telegrams	1 30
72	Bryant, Dan. D., hay	3 42
73	Seifert & Schoeffel, diplomas	20 00
74	Amer. Short Horn Breeders' Association, 25 volumes	7 00
75	Fuller, Frankie, work to date	7 50
76	Babbitt, C. salary	150 00
77	Gates, Fred., work on track	2 50
78	Hall, Thos., whitewashing	2 00
79	Troan I. E., oats	14 58
80	Johnson, Daniel, forage, 1883	10 00
81	Patterson, Mary, clerk	25 00
82	Gates, Fred., work on track	9 00
83	Scheler, Henry, hay	7 42
84	Dodd, Agt., H. B,, express	17 35
85	U. S. Express Co.. express	13 10
86	Eastman, John. work on track	25 00
87	Eastman. John, work on fair grounds	25 00
88	Babbitt, Clinton, salary	150 00
89	Culver, Edwin, work on grounds, self and team	11 25
90	Memhard, F., freight and drayage	1 65
91	Haley, D., work on track	6 75
92	Dodd, Agt., H. B., express	4 85
93	Patterson, Mary, clerk	25 00
94	Western Union Telegraph Co., telegrams	2 60
95	Photo Electrotype Co.	46 78
96	Hager, Joseph, team and self	4 50
97	Fargen, J., stacking hay	3 50
98	Atwood, David, printing	20 80
99	Eastman, John, work on fair grounds	25 00
100	Grady, F. M., mowing and hauling hay, etc	21 00
101	Eastman, John, materials	9 38
102	Nash, Richard, mowing and hauling hay	10 25
103	Caesar, C. H,, mowing	4 50
104	Wilkinson, Mrs. Julia, cooking for help	5 00
105	Nelson, Chas., mowing with team	6 50
106	Adams, J. Q , mowing	6 00
107	Hager, J., balance on mowing	1 50
108	Rockford Silver Plate Co., silver plate	418 80
109	Curtiss, Frank, work on track	12 00
110	Holverson, Halver A., mowing	3 00
111	Democrat Printing Co., work	18 20
112	Culver, Edwin, work on track	21 00
113	Patterson, Mary, clerk	25 00
114	Haley, Daniel, mower and self	3 75
115	Smith, Frankie M., office work	15 00
116	C. & N. W. R. R., freight and drayage	6 42
117	Stevens, J., carpenter work	19 75
118	Wiser & Ledwith, work on two signs	7 00
119	Eastman, John, work	12 50

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No.	To whom and for what paid.	Amount.
120	Eastman, John, expense per bill	$6 35
121	Ferris, Fred N., mowing	10 00
122	Childs & Co., S D., ticke s and print'ng	121 00
123	Dodd, agent, H. B., express	5 20
124	Smith, Frankie M., work to date	20 00
125	Patterson, Mary, office clerk	25 00
126	Jordan, Ada, office work	15 00
127	Prichard, Minnie, work to August 1	16 50
128	U. S. Express Co., expre s	3 05
129	Western Union Telegraph Co., telegrams	1 25
130	Breitenbach, M., drayage	2 06
131	Babbitt, Clinton, salary	150 00
132	Rhodes & Co., J. E., fair haying bee	6 49
133	Vail, Thos. J., joining Nat. Trot. Association	56 00
134	Tyner, A., agent, road machine	131 25
135	Babbitt, Eunice Iola, 7 days work	10 50
136	Babbitt, Clinton, salary	150 00
137	Eastman, John, work to date	25 00
138	Cex, A., straw	3 00
139	Stevens, J., carpenter work	11 88
140	Ellsworth, W. J., mdse. haying bee	5 80
141	Culver, Ed., work, man and tea	29 25
142	Sprecher John, extra work hauling	20 00
143	Sheldon, S. L., industrial fund	5 00
144	Sherie, Wm. H., work on grounds	17 25
145	Casey, John, labor	10 00
146	Storey, W. F., publishing	20 00
147	Fuller, Frank L., writing 10 entry books	40 00
148	Richard, Minnie E., work to date	39 00
149	Hall, Thos. K., stacking hay	2 63
150	Hagerty, D., 2 days work	3 00
151	Wood, J. W., expenses to Madison	5 00
152	Snow, W. H., carpenter work	12 25
153	Caesar, C. H., 3 days haying	4 50
154	Murtaugh, Wm., track work	6 75
155	Davie, Frank, 7 days fence work	10 50
156	Blake, Wm., work on track	7 50
157	Sh ne, Wm., haying	19 50
158	Hall, Thos., painting and haying	4 13
159	Quinlan, Tim., work on track	13 00
160	Snow, Edward, fence building	11 00
161	Culver, Chas., mowing	9 00
162	Knudson, Edwin, 5 days' work	8 25
163	Bradley, C. H., posting bills	12 00
164	Bradley, C. H., expenses and posting bil's	23 40
165	Ashard, W. H., haying and work on track	11 25
166	Patterson, Mary, office work	25 00
167	Gern, Patrick, fence building	15 00
168	Crossman, Patrick, fencing and labor	15 00
169	McKenna, D. W., posting bills	9 00
170	McKnight, John, fencing	16 50
171	McKnight, John, work at grounds	3 50
172	Case H. S., premiums, 1883	15 00
173	Snow, W. H., 4 days' work	6 00
174	Snow, Edwin, work on track	3 43
175	Warren, A., work on grounds	24 00
176	McKenna, John, work on grounds	17 62
177	Blake, Wm., work on grounds	4 50
178	Hahn, S., work	7 13
179	Sheiring, John, work on grounds	16 12
180	Hall, T., work	6 75
181	Nelson, Chas., work and tools	25 00

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No.	*To whom and for what paid.*	*Amount.*
182	Jewett, Nellie, ticket work	$16 50
183	Shine, Wm., work on Fair grounds	9 60
184	Quinlan, Tim, work on Fair ground	9 00
185	Snow, W. H., carpenter work	5 25
186	Murtaugh, Wm., work	3 00
187	Delap, C. A., straw	12 33
188	Blake, Wm., work	3 00
189	Knudson, Edwin, carpent r work	10 50
190	Bradley, C. H., billing	6 50
190½	Delap M., straw	4 55
191	Shirey, Henry, carpenter work	50 00
192	Johnson, David, free for all and 3 minute	225 00
193	Fuller, Geo. A., .45 and .35 races	165 00
194	Hodges, C. A., speed	275 00
195	Case, J. I., speed	175 00
196	Crockett, Col., premium	35 00
197	Sherman, A., ass't. in Agr'l Hall	6 00
198	Garrity, J. O., speed	120 00
199	Pilling, G. H., speed	180 00
200	Morse, E. D., speed	75 00
201	Groff, W. H., speed	105 00
202	Meston, A. J., speed	185 00
203	Williams, Daniel, 5 days' service	17 50
204	Arnold, A. A., Dep't B	24 00
205	Johnston, F. W., ass't Agr'l Hall	15 00
206	Buttman, S., 5 nights' watch	10 00
207	Johnston, W. A., Sup't Agr'l Hall	24 00
208	Fratt, N D., Ex. account Sept., 1883, to Sept. 1884	91 10
209	Fratt, N. D., eight days at fair	32 00
210	Stevens, Jesse, carpenter work	28 88
211	Stevens, Jesse, use of team	4 50
212	Kellogg, Geo., watch	8 00
213	Snow, Wm., carpenter work	6 00
214	Murtaugh, Wm., work at track	4 00
215	Cranefield, Fred, police	8 00
216	Titus, Frank, carpenter	5 25
217	Hook, J., police and watch	9 00
218	Eastman, J., work at grounds	10 00
219	Cowles, Lewis, work in fine art hall	15 00
220	Wood, Mrs., & J. W., premiums, depts. G and F	10 00
221	Brown & Sons, S. S., premium, dept. B	25 00
222	Meston, A. J., premium, dept. A	15 00
223	Stone, Miss E., premium, dept. K	23 00
224	Lyall & Beattie, premium, dept. A	21 00
225	Owens. J. E., premium, dept. D	90 00
226	Hook Bros., premium, dept. D	16 00
227	Anderson & Findlay, premium, dept. B	210 00
228	Raeside Bros., premium, dept. A	57 00
229	Raeside Bros., premium, dept. A	38 00
230	Baker & Son, premium, dept. A	129 00
231	Craven & F. Reynolds, H, premium, dept. K	11 00
232	Miller, R., premium, dept. B	200 00
233	Joiner, S. H. and A. E., premium, depts. D and B	117 00
234	Blake, Wm., work forage dept	9 00
235	Brown, Miss Kate, premium, dept. G	8 00
236	Brown, Geo. J., premium, department F	2 00
237	Fisher, Seth, premium, department B	25 00
238	Blake, Rose, ladies' attendant	10 00
239	Johnson, David, premium, department A	20 00
240	Potter, Miss Kate, assistant fine art hall	10 00
241	Munger, Mrs. H., premium, department E	40 50
242	Belding, Chas. H., premium, department E	22 00

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No.	To whom and for what paid.	Amount.
243	Belding, Chas. H., balance of premium	$19 00
244	Munger, A. A., premium, department D	4 00
245	Grady, Mrs. Mary, straw	12 33
246	Moffatt Bros., premium, department A	60 00
247	Vanduser, Rob., carpenter work	2 00
248	Hungerford, A. M., work at art hall	15 00
249	Goodenow, Mrs. H. D., premium, department K	3 00
250	Glosser, Levi P., carpenter work	15 00
251	Townsley, Barney, work	17 00
252	Troan, I. E., feed	115 86
253	Lutzow, Theobold, watch	14 00
254	Stuart, Jas. R., premium, department K	76 00
255	Eastman, John, work to date	25 00
256	Clark, John H., injured boy on fair grounds	2 75
257	Madison Mf'g Co., machinery department	23 39
258	Ashard, W. H., work on track	1 09
259	Dodd, Agt. H. B., express	18 80
260	Culver, Edwin, work of self and team	59 25
261	Shaffer, Jas. M., entry money refunded	10 00
262	Magan, Frank, watch	2 00
263	Magan, Frank, work	8 00
264	Davitt, Pat., watch. machinery department	17 00
265	Smith, Frankie, work	26 00
266	Ridy, John, mowing	9 00
267	Ridy, John, shoveling	7 50
268	Taylor, Miss Lizzie, premium, department K	9 00
269	O'Neill, Owen, work	14 00
270	Snow, Wm., work	6 00
271	Grady, Jas., forage department	8 00
272	Miller, Miss Mary, redemption of tickets	6 66
273	Lueders, John, band	160 00
274	Adams, B. F., assistant, horticultural department	28 00
275	Avery, C. H., premium, departments G and K	38 00
276	Northwestern Business College, premium, department K	13 00
277	Brady, T., premium, department I	2 00
278	Burdick, C. L., premium, department K	35 00
279	Patterson, L. J., premium, department K	8 00
280	Lucas, Mrs. Ellen, premium, department K	4 00
281	Olson, Louis, premium, department K	4 00
282	Steinle, Emelie	10 00
283	Brett, Mrs. Jas. E., premium, department K	7 00
284	Miller, Mrs. Emelie, premium, department K	2 00
285	Brown & Sons, S. S., money advanced	30 00
286	Askew, Mrs S. J., premium, department K	7 00
287	Brazee, Allen, assistant superintendent, Department B	24 50
288	Trask, Nathaniel, watch	2 00
289	Trask, N., watch	6 00
290	Chase, Nellie C., premium, department F	10 00
291	Chase, Water, premium, department K	15 00
292	Knudson, Edwin, carpenter work	2 00
293	Grady, Frank, straw	12 15
294	Grady, F. M., straw	14 18
295	Grady, F. M., hay	27 64
296	Henrichs, E. and M., machinery in department H	76 69
297	Hall, Thos., watch and painting	2 75
298	Neihs, John, white-washing	35 00
299	Miller, C. B., premium, department B	115 00
300	Long, Elias, premium, department G	2 00
301	Schiffler, Miss P., premium, department K	7 00
302	Reiner, John, bill poster	4 00
303	Jones, N. P., premium, department K	20 00
304	Schmidt, Philip, premium, department F	3 00

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No.	To whom and for what paid.	Amount.
305	Brockway, R. A., assistant, department E	$6 00
306	Reed, Wm., watch	2 00
307	Hall, S. H., premium, department F	10 00
308	Baker, Elsie, premium, departments E and F	4 50
309	Sullivan, John, watch	10 00
310	Baker, Elsie, premium, department F	2 00
311	Wilson, H. C., premium, department, F and G	13 00
312	Foresman, Agent W. M., freight	13 98
313	Cooper, Annie, W., premium, department F	10 00
314	Good, Thos. G., premium, department F	3 00
315	Dickerman, J. A., assistant, department A	24 50
316	Dutton, Mrs. L., premium, department K	2 00
317	Storm, W., mdse per bill	14 05
318	Storm, W., work and team	21 00
319	Storm, W., premium, department F	2 00
320	Reeves, Mrs. E. M., premium, department K	3 00
321	Hughes, A. G., premium, department I	3 00
322	Quinlan, Tim, work fair grounds	14 00
323	Loomis, Geo. H., premium, department A	10 00
324	Cramer, Fred, premium, department A	10 00
325	Summer, Jas. W., posting bills	1 50
326	Hallock, Mrs. Youngs, premium, department K	2 00
327	Hallock, Miss Mary, premium, department K	2 00
328	Hayden, Thos., conveying ex. board	2 00
329	Wilson, D. S., premium, department G	2 00
330	Wilson, Mrs. D. S., premium, department K	4 00
331	Lake City Tool Co., material	9 10
332	Ritchie, Mrs. Frank, premium department K	5 00
333	Summer, Jas., conveying injured boy to depot	1 50
334	Fitch, Deming, hay and straw	157 90
335	Toepelman, Ed., premium, department A	2 00
336	Sheasby, F. C., painting signs	100 75
337	Bixby, Jerome, premium, department A	12 00
338	Burdick, F. O., premium, department K	10 00
339	Schuster, Henry, departments G and F	25 00
340	Cheney, Miss Ellen, premium, department K	3 00
341	Domestic Sewing Machine Co., premium, department K	7 00
342	Schulof, Mrs. E J., premium, department K	3 00
343	Rood, Mrs. E. L., premium, department K	2 00
344	Dorn, Mrs. M. M. premium, department K	6 00
345	Brown, Mrs. A. S., premium, department K	2 00
346	Tenney, H. A., premium, department F	13 00
347	Raffel, Miss Kate, premium, department K	2 00
348	Steeg, G., premium, department F	14 00
349	Morgan, T., premium, department C	43 00
350	Stone, J. B. premium, department B and F	23 00
351	Morgan, T., entry refunded	1 50
352	Peffer, Kate F., clerk	14 00
353	Peffer, Kate F., assistant superintendent fine arts	17 50
354	Jacket, Warren, premium, department F	5 00
355	Jacket, Abram, premium, department F	7 00
356	Smith, Kate, washing windows	2 00
357	Boyce, Reuben, premium, departments A and D	63 50
358	Burrington Bros., premium, depar ments A and F	22 00
359	Munger, H. E., premium, department E	1 50
360	Lytle & Merriman, premium, department D	6 00
361	Haley, Louis, work	4 00
362	Clark, R. B., premium, departments D, F and E	67 00
363	Calhoun, Mrs. P. P., premium, departments D and K	4 00
364	Conover, Allan D., laying out track	23 00
365	Scheibel & Krehl, premium, department I	5 00
366	Robinson, J. W., premium, department A	25 00

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No.	To whom and for what paid.	Amount.
367	Conlin, Peter, drayage	$4 00
368	Patterson, Hattie, telephone operator	9 00
369	Parkinson, John, entry clerk	14 00
370	Hough, Miss Georgia, premium, department F	2 00
371	Isaacs, A. C., premium, department K	20 00
372	Gilbert, Miss Jessie, premium, department F	2 00
373	Shine, Mrs. G. A., Ladies Hall a tendant	8 00
374	Dorn & Co., M. M., livery	99 50
375	Atwood, Mrs R. J., premium, department F	19 00
376	Austin, E. I., premium, department D	19 00
377	Wise, G. W., premium, department K	5 00
378	Hickox, George, premium, depar ment F	10 00
379	Spaulding, A. W., premium, department E	2 00
380	Kiser, J. C., premium, department B	35 00
381	Bowers, Henry, premium, department F	5 00
382	Angell, C. E., departments F and I	63 00
383	Harding, George, premium, depar ments C and E	32 00
384	Bailey, N. R., premiums, departments F and K	13 00
385	Ringrose, George W., premium, departments G and F	42 00
386	Cass, James D., department E	8 00
387	Davis & Co., George, premium, departments D and F	104 00
388	Newcomb, Mrs. S. B., premium, department K	17 00
389	Larkin, Frank, assistant, department A	16 00
390	Gölz, Fred, work	12 00
391	Mosher, D., premium, department B	10 00
392	Wilcox & Son, E., premium, department G	11 00
393	Miner, Cyrus, expenses and sundries	32 00
394	Miner, Cyrus, treasurer fair	24 00
395	Wood, J. W., expense winter mee ing	9 00
396	Sullivan, C., attendant	10 00
397	Smith, Jr., Mark	2 00
398	Goldsborough, F. C., premium, department C	48 00
399	Joslyn, Miss Kittie, premium, department K	8 00
400	Mill, R. H., premium, department C	44 00
401	Boley, Joel, premium, department K	10 00
402	Abbott & Sons, George, premium, department B	30 00
403	Shine, Wm., work	15 00
404	Mead, C. W., premium, department F	12 00
405	Mead, S. L., premium, department F	14 00
406	Palmer, Wm., premium, department F	4 00
407	Pammel, L. H., premium, department K	7 50
408	Morse & Son, J. W., premium, department B	115 00
409	Baldwin, C. I., premium, department F	3 00
410	Baker, W. T., premium, depart ent E	2 00
411	Bement, E. R., premium, departments D and F	24 00
412	Hill, H. J., premium, department F	7 00
413	Burgess, Mrs. Jas. E., premium, department K	13 00
414	Wiser, John B., premium, department I	6 00
415	Bird, F. A., premium, department D	8 00
416	Adams, Quincy, work with team	43 50
417	Adams, Quincy, work with team	27 50
418	Haaks, Wm., repairing pump	2 15
419	Sayre, Jr., Frank, work	8 00
420	Brabazon, J. R., premium, department E	66 50
421	Crawford, J. N., premium, depar ment C	52 00
422	Fuller, Frank, work	59 50
423	Prichard, Minnie, work	59 50
424	Park & Co., W. J., mdse	6 60
425	Patterson, Mary, extra work	20 00
426	Stephenson, Geo., premium, depar ment C	13 00
427	Collard, Chas., premium, department C	14 00
428	Caldwell, Robt., premium, depa tments F and A	22 00

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No.	To whom and for what paid.	Amount.
429	Everson, Wm., premium, department F	$10 00
430	Sumner & Morris, mdse	9 83
431	Sumner & Morris, premium, department I	5 00
432	Long, Elias, repairs on scraper	6 00
433	Craven, & F. Reynolds, H., premium, department K	3 00
434	Gyles, Sam'l, carpenter work	7 00
435	Shine, Wm., work	6 00
436	Forrest, Wm., premium, department D	8 00
437	Fox, Wm., premium, department G	7 00
438	Gage, R. H., premium, department D	13 00
439	Gillett & Moore, premium, department B	30 00
440	Hicks & Sons, J. B, premium	4 00
441	Hirschinger, Chas., premium, departments F and G	33 50
442	Laramy, T. W., premium, department B	25 00
443	Hopson, M. W., premium, department F	7 00
444	Jeffrey, Geo., premium, departments F and G	78 00
445	Crockett, W. D., premium, department A	35 00
446	Frazer & Lobdell, premium, department C	14 00
447	Fish, H. Z., premium, department F	26 25
448	Jackson, J. F., premium, department B	10 00
449	Kellogg, Edith A., premium, department G	8 00
450	Kellogg, Geo. J., premium, department G	3 00
451	Kellogg, R. B., premium, department A	40 00
452	Le nard, L. B., premium, department A	25 00
453	O'Malley, Jos., premium, department C	19 00
454	Maxon, F. W., premium, department B	35 00
455	Pi grim, D. T., premium, departments F and G	79 00
456	Pitcher, J. H., premium, department C	63 00
457	Brazee, Allen, hay	36 77
458	Hall, Thos., watch	4 00
459	Zehnter & Co., Julius, badges	21 94
460	Hiestand, Mrs. J. K., premiums, departments F and G	21 50
461	Reed, Wm., premium, department G	37 00
462	Peffer, Miss Nellie, premium, department G	7 00
463	Peffer, G. P., premium, department G	51 00
464	Dunlap, S., premium, departments E and F	4 50
465	Thatcher, Geo., premium, department B	25 00
466	Townsend, Geo., premium, department G	24 00
467	Dunlap, S., work	8 00
468	Tuttle, A. G., premium, department G	53 00
469	Smith, J. M., premium, department F	21 00
470	Steele, Wm., premium, department B	10 00
471	Walker, Fanny L., premium, department K	5 00
472	Wilson, E., premium, department E	28 00
473	Wright, J. T., premium, department B	40 00
474	Mann & Son, S. S., premium, department B	60 00
475	Wait & Son, E., premium, department D	63 00
476	Vanderhoff & Cobb, premium, department B	30 00
477	Lewis, E. D., premium, departments F and G	38 00
478	Heldreth, Lansing E., premium, department F	3 00
479	Case, J. I., premium, department A	25 00
480	Bowles & Hadden, premium department A	43 00
481	Membard, Mrs. Geo., premium, department G	30 00
482	Currie, John, premium, department A	15 00
483	Dodd, agent, H. B., express	3 85
484	Campbell, Henry, premium, department A	15 00
485	Taylor, H., premium, department F	7 00
486	Devine, Mike, work	7 50
487	Specher, John, premium, department A. and B.	19 00
488	Sprecher & Son, John, hay	7 40
489	Preim, August, premium, department A	8 00
490	Macomber, S. D., premium, department A	15 00

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No.	To whom and for what paid.	Amount.
491	Galbraith Bros., premium, department A	$125 00
492	Morse, L. C., premium, department A	12 00
493	Randall, Barber, premium, departments A. and D	28 00
494	Daubner, Geo. S., premium, department C	6 00
495	Salisbury, Mrs. D. F, premium, department G. and K	3 00
496	Stephenson, Geo., for silver plate	6 00
497	Palmer, E. W., premium, departments F. G. and E	22 00
498	Bird, Mrs. W. R., premium, department K	2 00
499	Wyant, L. B. museum display	30 00
500	Doyon, Mrs. M. R., premium, department K	2 00
501	Merrill, Alf., premium, department A	5 00
502	Smith & Nebel, programme	15 00
503	Clark, C R., horse rode by Mars	10 50
504	Vilas, Cornelia, premium, department K	4 00
505	G. A. R. Post No. 11, dinner tickets	3 66
506	Drakeley, R., police	8 00
507	Western Union Telegraph Co., telephone and telegram	39 02
508	United States Express Co., express	2 05
509	Brown, P. W., premium, departments F. and G	17 00
510	Vroman & Mason, lumber	142 82
511	Stein & Co., C. R., lumber	252 00
512	Harrington, Tim, sweeping	2 00
513	Kentzler, Andrew, livery bill	17 00
514	Atwood, David, printing	35 00
515	Babbitt, Clinton, salary	150 00
516	Rowe, Byron, premium, department A	25 00
517	Newton, I. S., premium, departments F. and K	10 60
518	Nelson, Chas., premium, department F	2 00
519	Newton, Mrs. E., premium, department K	4 00
520	Getts, C., premium, department K	4 00
521	Heath Bros., premium, departments B. and F	33 00
522	Fuller, Frank, work	16 50
523	Holt, E. C., premium, department F	6 00
524	Hatch, Eugene, premium, department C	21 00
525	McDougal, Ella, premium, department G	1 00
526	McDougal, Geo. W., premium, department F	3 00
527	Sec'y American Short Horn Breeders Asso. 26 Vol. H. B	7 00
528	Tipple, R. E., premium department, F	10 00
529	Toole, Wm., premium, department G	1 00
530	Vial, A., premium, department G	1 00
531	Shepard, Mrs. E. R., premium, department F	2 00
532	Schmitt, Fred, premium, dep't F	3 00
533	Osmond, W. M., premium, dep't A	10 00
534	O'Malley, Miss Ellen, premium, dep't K	1 00
535	Bissekinner, J. H., premium, dep't G	3 00
536	Babbitt, Arthur O., dep't F	5 00
537	Bailey, A. S, premium, dep't F	3 00
538	Cook, W. H., premium, dep't F	2 00
539	Philips, Henry, premium, dep't F	5 00
540	Carr, Mrs. N. B, premiums, dep'ts K. and F	8 50
541	Crampton, Mrs. N. B., premiums dep't K	2 00
542	Cook Bros., premium, dep't F	3 00
543	Seward, M. N., premium, dep't F	8 75
544	Seward, M. N., cheese destroyed, 1883	5 80
545	Dunning & Sumner, mdse	32 30
546	Pritchard, Minnie, work in full to date	33 33
547	Patterson, Mary Etta, work in full to date	33 33
548	Baldwin, C. S., watch	2 00
549	Warren, Albert, gate keeper	14 00
550	Pilgrim, D. T., expense and sundries	4 00
551	Gilbert, W. A., ass't Forage dep't	21 00
552	Pilgrim, D. T., sup't Forage dep't	36 00

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No.	To whom and for what paid.	Amount.
553	Bennett, Jas., work on track	$8 00
554	Terwilliger, S., ass't marshall	26 00
555	Bird, F. A., ass't marshall	26 00
556	Martin, C. L., marshall	33 00
557	Bradley, C. H., work in Art Hall	6 00
558	Clark, D. J., helper	2 00
559	Hitt, Chas. J., assistant superintendent manufacturs	21 00
560	Hitt, H. D., superintendent manufacturers hall	40 00
561	Gregory, Miss Fanny, assistant art hall	10 00
562	Warren, A., carpenter work	14 00
563	McDougal, G. W., assistant superintendent grounds	42 00
564	Fisher, C M., gate-keeper	13 00
565	Anderson, Edwin, work	8 00
566	Pierce, A. W., carpenter	7 00
567	Pierce, A. W., watch	2 00
568	Sholts, O. W., watch	2 00
569	Crotensburg, N., watch	18 75
570	Cook, Robert, watch	10 00
571	Avery, A A., assistant machinery department	21 00
572	Riverside Prin ing Co	40 00
573	Childs, S. D., stamp	1 50
574	Newton, T. L., printing circulars	33 20
575	Newton, T. L., superintendent machinery department	56 00
576	Seaver, J. E., assistant superintendent machinery depa't	49 00
577	Winehell, Wm., use of tent	30 00
578	North, C. F., gate-keeper	10 00
579	Sherman, A. M., police	8 00
580	Doyle, Pat, police	6 00
581	Pierce, A. W., watch	4 00
582	Lord, J. H., watch	6 00
583	Philips & Co., J. P., coal and engineer	26 25
584	Fields, P. B, gate-keeper	17 50
585	Rhodes, H. J., police	10 00
586	Bane, W. M., work	7 50
587	Trainer, D., police	8 00
588	Hill, F. A., police	8 00
589	Palmer, Will, work	8 00
590	Sholts, O. W., police	8 00
591	Main, A. H., assistant treasurer	30 55
592	Hess & Schmitz, horse and buggy for treasurer	12 00
593	Fisher, C. C., work at agricultural hall	8 00
594	Corcoran, Martin, work, department B	5 50
595	Barry, M. A, fence police	8 00
596	Palmer, W., work on track	8 00
597	Wood, J. W., superintendent art hall	40 50
598	Ramsay, De Witt, mdse.	91 87
599	Babbitt, Arthur O., work	18 50
600	Baker, Jas, W., assistant superintendent agricultural hall	21 00
601	Baldwin, C. H., watch	6 00
602	Ball, Jas., work	8 00
603	Dutcher, W., watchman	8 00
604	Main, Geo. C., ticket seller	15 00
605	Whalen, M., police	8 00
606	Moran, T. C. work	8 00
607	Robertson, And., gate keeper	17 50
608	Bowles, C. E., ticket seller	18 50
609	Marslin, T. H., gate keeper	17 50
610	Gay, W. M., assistant superintendent, department E	28 00
611	Blair, F. J., superintendent, department E	24 00
612	Clark, R. C., engineer	15 00
613	West, S. G., gate keeper	17 50
614	Allen, S. H., gate keeper	17 50

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No.	*To whom and for what paid.*	*Amount.*
615	Hopkins, A. H., ticket seller	14 25
616	Atwood, Chas., ticket seller	11 00
617	Heimstreet, E. B., ticket seller	18 50
618	Clapp, Geo., gate keeper	17 50
619	Jeffrey, Geo., work	3 00
620	Brownell, I. C., ticket seller	18 50
621	Pratt, Orris, superintendent, department C	32 00
622	Smith, J. M., superintendent horticultural department	24 00
623	Kenyon, S. B., gate keeper	10 00
624	Hicks, J. H., superintendent department D	36 00
625	Clark, D. J., gate keeper	24 00
626	Babbitt, Clinton, salary	150 00
627	Vernon, R. C., services, department A	6 00
628	Dunton's Spirit of the Turf, advertising	20 00
629	Regan, Thos., water, etc.	135 00
630	Heistand, Wm., work at fair	6 00
631	Van Cott, A. B., H. Cravens' silver plate	12 00
632	Morden, E., tanks	10 02
633	Eastman, John, work	25 00
634	Hamilton, W. H., materials	8 50
635	Fizette, Wm., dinners, per order R. B. Ogilvie	20 29
636	Vroman & Mason, lumber	42 25
637	Frederickson & Fish, lumber	74 81
638	Prichard, Minnie E., work	13 50
639	Babbitt, Clinton, salary	150 00
640	Cook, W. H., premium, department F	3 00
641	Palmer, Wm., police	8 00
642	Walch, Wm., work	8 00
643	Eastman, John, work	37 50
644	Cantwell, M. J., printing	157 75
645	Western Union Telegraph Co., messages	2 30
646	Riley & Corcoran, livery	55 10
647	Bayley, W. A., work	3 00
648	Babbitt, C., traveling and incidental expenses from December, 1883, to December, 1884	44 81
	Total of orders issued by secretary	$17,133 18
	Orders 143, 366, 369, 429, 451, 461, 471, 482, 498, 519, 525, 542, 640, 644, 645, 646–648 not presented at date of this report	423 96
		$16,709 22
	Paid dinner tickets	259 82
	Orders of 1883	156 75
	Cash balance on hand	4,125 83
		$21,251 62
	Miscellaneous orders paid on indebtedness of 1883 amount to	$1,759 64

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EXHIBITION OF 1884.

OPENING ADDRESS.

Hon. N. D. FRATT.

Fellow-Members of the State Agricultural Society:

LADIES AND GENTLEMEN — With the close of the more active portion of the agricultural year, we once again meet in council. While we have been busy with our varied enterprises, time has been busy with us. The projects, hopes and labors of the year are among the things that were. What these hopes and projects have been, and what the success, each one individually knows. That on the whole, the year has been a fairly prosperous one is shown by the cheerful activity, the hopeful faces, and the grand display of the fruits of these labors, which I see on every side surrounding me. From what other class of men in all this great land could be gathered in the face of the smiling heaven, an assemblage so large, so active, so enterprising, so healthful, so pleasant to look upon, so free from corroding care, as the one here met in our joyful annual re-union. "Comparisons are odious," says Shakspeare's Dogberry, notwithstanding which, let us congratulate ourselves that we are farmers.

HERE, MY FRIENDS,

a little talk on the development of fairs which are so intimately connected with the progress of agriculture, that they are probably the best stimulus and aid to advancement that we have.

The origin of fairs is lost in the mists of long passed ages. From the best information we can get they were at first not at all connected with agriculture, but were formed by the gatherings of pilgrims during the dark ages about sacred places, especially about the abbeys and cathedrals on the

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feast-days of the saints enshrined in them, but they were always connected with the sale or exchange of merchandise. Bishops and abbots, of course, never over-looked the tolls on the trading which was carried on within their jurisdiction. In the course of time, bishops and other ecclesiastics issued licenses to trade, called "indultus;" and there are still held fairs in South Germany called "dulte;" as for instance, the "Jacobi dult" at Munich, on Saint James' Day. Every fair was called after the saint whose feast-day called it to life. They lasted three days, the day of assembling, the feast day, and the day after the feast.

FAIRS IN ENGLAND

were ordinarily held in the church yards, until this was forbidden in the thirteenth year of the reign of Edward the Second. In these fairs there was always the attraction of tricks and juggling, besides that of *fair* and *un-fair* trading, and generally the performance of some drama or comedy founded on the teachings of the priests and monks. These last made generally the great attraction of the fair, and in them the monks were most unmercifully ridiculed. Robbery at booths in the fairs was then common, if we may believe contemporary writers. Thus, the writer in the fourteenth century of the "Vision of Piers Ploughman." makes covetousness tells us, "first I learned to lie; wickedly to weigh was my first lesson; to Wye and Winchester I went to the fair, with many manner merchandise, as my master me hight, and it had been unsold this seven year, so God me help, had there not gone the Grace of Guile among my chaffer." Let us hope that this "Grace of Guile" may not form the connecting link in the chain of development from the ancient to the modern fair. Agricultural societies were formed several years before the conception and the establishment of *fairs* in this country. The first society for the

PROMOTION OF AGRICULTURE,

was formed by merchants, professional gentlemen and a few owners of farms in Philadelphia in 1785. Similar associations were formed soon after at Charleston, S. C., New

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York and Boston. These societies were at first ridiculed by the practical farmers; but it was soon found that the reports of these societies contained much that was valuable. On the fourth of July, 1785, General Washington was chosen an honorary member of the society in Philadelphia, which was then the seat of government. It is most interesting to note in the records of the time the endeavors of the "Father of his country," "to secure through the National Congress the establishment of a Central National Board of Agriculture recommended by me (him) at the opening of the session." In 1804 it was suggested by Dr. Thornton, the first commissioner of patents, "that the ready sale of cattle and of domestic products could be promoted by the holding of fairs, or market days, as in England, his native land." The municipal authorities in Washington, D. C., passed an act establishing semi-annual fairs. This was warmly approved by the citizens. The fair was held Wednesday, Thursday and Friday, "on the mall at the south side of the Tiber, extending from the bridge at the centre market to the Potomac." It was a success, and the city government appropriated fifty dollars towards a fund for premiums. The citizens raised an equal sum, so that at the next fair, which began on the 26th of April, 1805, one hundred dollars was awarded "to the best lamb, sheep, steer, milk cow, yoke of oxen, and horse actually sold." About this time, the determination of the people to wear goods of domestic manufacture, gave an impetus to

WOOL GROWING

and importation of choice sheep became a mania. This led to "sheep shearings," and these became the "farmer's festivals." George Washington and Parke Curtis continued their "sheep shearings" for a dozen years at Arlington, opposite Washington, on the Virginia side of the Potomac. "I cannot take time to tell of the premiums offered, of the speeches, by these old Virginia gentlemen, but must say that the host in his speech would always bring forward his project of "establishing a National Agricultural Organization, to be incorporated by the government,

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and attached to a National University." In 1809 was organized the "Columbia Agricultural Society." It was the germ of a national organization, embraced different states, and initiated agricultural exhibitions. A most interesting account of the first six of these semi-annual exhibitions may be found in the report of the department of agriculture, at Washington, for the year 1866. Most interesting is it to learn that the first meeting was attended by the president and his lady, the secretary of state, the secretary of the treasury, the secretary of war, and I believe by nearly the entire cabinet, besides many other distinguished people from abroad. Most interesting also is it to know, that nearly every person present wore clothing of domestic manufacture. President Madison wore his inauguration suit, the coat made from merino wool of Col. Humphrey's flock, and the waist-coat and small clothes made from the wool of the Livingston flock. Gen. John Mason wore a suit of Nankeen, made from Nankeen cotton raised on Analoston Island.

"After what was called the last war with Great Britain, very little agricultural progress was made for several years. In 1837 and 1838 the importation of breadstuffs to the amount of several millions of dollars aroused the attention of the nation to the necessity for agricultural improvements. In 1841 a convention of gentlemen was held at Washington to organize a 'National Agricultural Society,' with the fund bequeathed by Hugh Smithson for its support. The establishment of the 'Smithsonian Institute' prevented this organization, and the National Society remained dormant until 1852, when another convention was held at Washington, where were present delegates representing twenty-three states and territories, and then and there the United States Agricultural Society was organized. The annual meetings of the United States Agricultural Society were, until the commencement of the war, a realization of the 'National Board of Agriculture,' recommended by Washington.

"National exhibitions and 'field trials' were held by the United States Agricultural Society at Springfield, Mass., Springfield, Ohio, Boston, Mass., Philadelphia, Penn., Syracuse, N. Y., Louisville, Ky., Richmond, Va., Chicago, Ill., and

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Cincinnati, Ohio. Since that time the various state societies have held with great regularity, their annual fairs in all the Northern States. They are becoming an institution in the south also, and are the surest index of our prosperity as an agricultural people, and probably the most efficient means of agricultural progress."

I am not aware my friends, that our calling has ever been entitled a "learned profession." On the contrary, if the truth must be told, we have been thought to be the opposite of learned.

A farmer in the olden time has been rather considered to be the synonym for clod-hopper, hind, boor and dolt, or whatever other name would signify ignorance and stupidity. Let us confess that in time past, there has been too much reason for this practice and charge, but we have changed all this, we appreciate now, as never before, the necessity of knowledge and theory based upon knowledge, as underlying all successful practice; but truth further requires us to state, that a larger measure of appreciation yet awaits us, and we shall never attain that success which is our privilege until this appreciation is realized.

Leaving for a moment intellectual considerations, let us think of the moral influence of these annual meetings upon us farmers as a class. They are second only in their good influences to those delightful gatherings in which it is now somewhat fashionable to indulge. I refer to re-unions of widely scattered members of the same family relationship, all met at the old paternal homestead; or the similar gatherings of the alumni of colleges, of members of the old New England schools, met to renew old acquaintances, to bring back the memories of the past; to teach many a heart with sad and tender, yet beneficent recollections, to exchange

MUTUAL CONGRATULATIONS

and good wishes, and create a pleasure-giving epoch in every life. I said, we have never been regarded as members of a learned profession. What are considered to be the learned professions? The legal, the medical and the theological. Yet, what *one* of them has learned the value of

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such gatherings, as are these to us, in promoting our well-being as a class? Here, year after year, we assemble to renew in amity and generous fellow-feeling our past associations and friendships; to circulate the knowledge of those paths to prosperity gained during the past year by what Tyndall calls "the beautiful logic of experiment;" to profit in our individual capacities by the knowledge, the science, and the inventions of the entire farming community; and, finally, to return to our homes with a higher ideal of man, and of the capabilities and delights of our profession. We look in vain for such associations among either of the professions before mentioned. Where is the amity in the medical fraternity? Warring schools in theory and practice arise and form an effectual barrier to such a universal manifestation of good will. For the legal profession, although Blackstone has given us such noble statements of the dignity and nobility, and the source of law, to the vision of most of us, the spectacle seems rather that of union for the practice of chicanery and the perversion of right as often as for the establishment of justice.

IN THE THEOLOGICAL WORLD,

where there would seem to be every inducement to mutual kindness and co-operation, it is lamentable to see the disciples of the Prince of Peace indulging in bickerings, in envyings, and all uncharitableness. Let us pass lightly over these various disagreements, and unpleasant rivalries in these "learned professions," and thankfully accept the truth that no such spirit animates us as a class, but that we know that progress in *one* branch of our science, and the benefits resulting therefrom to individuals, react upon the whole body, and tend to the good of all. No improvement can be made in machinery, no improved process in agricultural practice which is not as soon as understood, the property and advantage of us all. Though this may be true in other pursuits, it is certainly not so directly received and appropriated. They have been, and they are the "learned professions." Learning is the very foundation and necessity of their existence. But though in time past it has not been

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recognized, it is now fully conceded that learning is equally, and, it may be to a greater degree, a necessity to success in agriculture.

THOUGH ALL KNOWLEDGE

is connected, and one thought or truth leads to another throughout the infinite realm of mind, yet the *necessary* knowledge for these so-called learned professions is not so varied, not so extensive, not so universal in its relationship, as that which is a necessity to the greatest success in agriculture, compared with agricultural life and development. The "learned professions" are collateral issues, and side growths pertaining to the great onward march of the life of the world. They are necessary, and possess resources and aims sufficient to occupy the faculties of the greatest in their ranks. But the life of the thoroughly educated agriculturist includes them all. They are all more or less helpful to his practice, and the whole world of natural science is more directly a necessity. Thus we see that however it may have been in time past, in the present day, agriculture may justly claim the foremost rank among those noble pursuits based on learning and science. What, then, are the elements and attainments necessary to the ideally perfect farmer. In these days, in which importance is attached to heredity, he must be well born.

He must possess those natural powers, physical, mental and moral, which make up the perfect man; among these must be included the imaginative, which is the inventive faculty. He must be favored with a good education, which is not the mere reception and holding of the ideas of others; whether derived from books, or from intercourse with his fellows; but which must be the harmonious development leading forth—of all the powers of body, mind and spirit. Accompanying this education, must be a wide-awake, active and comprehensive disposition, enabling him to establish analogies, and to perceive relations. This, in connection with the imagination, will make the progressive man, and the inventive man, ever devising something new in principle and practice, which will be the source of all progress; added to all this, must be cultivated a sound judgment which

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will guide and control the inventive faculty, and make the *practical* man. All knowledge is to this man material; it becomes the necessary means of growth, instead of being the impediment of the learned but unsound and unpractical man.

> "They bide their time, and well can prove,
> If need were, their line from Jove;
> Of the same stuff, and so allayed,
> As that whereof the sun is made;
> And of the fibre, quick and strong,
> Whose throbs are love, whose thrills are song."

We have made our ideal farmer to be the practical man; let us now try to realize how the practical farmer must base his practice upon well founded theory, for *theory* as differing from *practice* is science. This is saying that the farmer must carry on all his operations upon a scientific basis. The time is now coming — rather it has come — when the farmer who depends for success solely upon experiment, or upon a blind following of old methods because they are old, cannot hope to compete with his better equipped, better instructed, and more progressive neighbor. The one like Maud S. will be first, and the others will be nowhere. Let us very briefly, and of course superficially, glance at some of the necessities of agricultural practice, and note the philosophy or science underlying each. First,

TILLAGE HUSBANDRY.

This embraces the raising of the grains and roots, and indeed all products which require the use of the plow, harrow and cultivator, in the fit preparation of the soil. It requires a knowledge of the best modes of plowing, and other pulverization of the soil; knowledge of the chemical constituents of the soil, of the grain, and of the manures and specific food needed for the growing plants. These elements must be found in the soil, or must be applied to it to meet these needs. It includes also the harvesting, securing, and preserving of the grain when grown. It includes under-draining, whether by sub-soil, plow or tile drains, and requires a knowledge of the principles necessary to their use and application. The object of plowing being the pulverization of

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the soil, it follows that that mode which best accomplishes this result, will be, under ordinary circumstances, the best mode. The object of this pulverization is to enable the roots of the growing plants to penetrate to all parts of the soil in search of food; to enable the light and air, the rain and gases, readily to enter the soil. Another, and probably the most important result of this pulverization is the increased production of nitrates, the organized remains of former crops and manures being oxydized, the nitrogen being converted into nitric acid.

MARKET GARDENERS,

who from long practice have found the necessity of this pulverization (generally use the spade in this operation) and many of the most intelligent farmers in England and Europe, where labor is cheap and agricultural products bring large prices, contend that this is the best mode of raising crops generally upon their farms. Though in this country this is neither economical nor desirable, yet the experience of these practical men, as well as the philosophy of the operation, will convince us that this is theoretically the most perfect preparation of the soil, and the nearer we can, by plowing and sub-soiling, approach to the perfection of spading, the more completely will this preparation of the soil be accomplished. There are reasons also that affect the *times* of plowing soils of different degrees of tenacity. Stiff, clayey soils should, whenever it can be done, be plowed in the fall, so that they may be exposed to the decomposing influences of the rains and frosts of winter. I am not ignorant that some of our friends contend that a knowledge of the chemical constituents of the soils and the grains is not necessary to successful practice, but it seems to me manifest that reason, and I believe practice, will lead to a different conclusion.

Let me give a little illustration of the necessity of such knowledge. It is well known that on many of our fertile prairie soils, the grains — wheat and oats — will frequently rust so badly, that the crop will be a complete failure. This rust is apt to appear in the warm moist atmosphere attend-

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ing frequent showers alternating with sun-shine; the moisture softening and swelling the stalk of the plant, causes it to burst or crack; in the cracks thus formed the minute germs of the rust-plant find lodgment, germinate, send their minute rootlets into the substance of the stalk, intercept and appropriate the nutriment which should pass to the growing grain, and the evil work is done; all this is the result of a lack of soluble silica in the soil. This silica forms the glassy covering which should coat the stalk and exclude the moisture which causes its rupture. The necessity, then, is to supply to the stalk the needed covering of glass; potash applied to the soil either directly or in the manures which contain it, dissolves the silex which is already there, and renders it appropriable by the growing plant. The growth of the corn also, which is heavily coated with this soluble silex, and which it brings from depths of which the roots of the smaller grains cannot penetrate, supplies the deficiency. Then, the essential thing for the prevention of rust is the application of potash, and of the cereals and the grasses, which are all largely covered with this silex, in the form of manures to the soil. To deny this need of the adaptation of the elements of plant-life in the soil to the particular kind of plant grown is to deny the relation of.

CAUSE AND EFFECT,

than which nothing can be more unreasonable and absurd. The reason for the practice of the rotation of crops is also the need of certain specific elements of nutrition for one class of plants, and of certain other elements for a different class. The elements which are not needed for a crop of one kind, are reserved to be appropriated by the succeeding crop to which these elements may be particularly adapted. Another reason for rotation of crops may be found in the fact that it is the function of some plants to absorb and retain large stores of the needed elements for other plants. Thus cereal crops most need nitrogenous manures. They get their *nitrogen* almost exclusively from nitrates; but the form in which nitrogen is chiefly present in the soil, is not suited to them.

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Notwithstanding, then, the small amount of nitrogen in the cereals, they are among those plants most benefited by nitrogenous manures. Now the clovers and all the leguminous plants possess the property of containing a great amount of nitrogen; at least twice as much as do the cereals; the amount of potash and lime in these plants is also very great. The oxygen in the atmosphere, oxydizing these leguminous plants, both root and surface growths, changes the nitrogen into nitric acid, which again, uniting with bases in the soil, forms nitrates, which are readily soluble, and are the direct food of the cereals. In land which has ordinary fertility resulting from reasonable application of barnyard manures, the supply of plant-food is large, and a luxuriant growth may usually be obtained by supplementing the elements usually found in the soil by a few specific elements in small quantities for particular crops in their order of rotation. Thus the cereals may need a special application of nitrate of sodium, and superphosphate, and then a full crop of either barley, wheat or oats may confidently be expected. In like manner the use of nitrate of sodium alone, will produce a full crop of mangels; superphosphate alone, a full crop of turnips, when the season is favorable; and potassium salts alone will produce a most beneficial effect on pastures and the clovers. It is not the intention of this address to teach the

SCIENCE OF AGRICULTURE.

My object is to present in a brief and simple way, the relation of science to practice, and to give a few illustrations of this relation, hoping that by such means, the majority of us may more clearly see the great need of knowledge as the ground and promise of prosperity. Let us now occupy ourselves for a few minutes with the subject of under-draining. The first and most direct effect is the removal of surplus water from the soil. The presence of this water in wet seasons and especially in heavy soils, is a most serious hindrance to the growth of vegetation; with the water line lowered, you may expect a full crop, when otherwise you would have a very small return. All good influences stop at the water

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line; all follow and are effective as this line is lowered. Under-drained soils are alike by the drougths of summer and the frosts of winter, rendered friable and porous for the entrance of the atmosphere with all its life-giving influences, and for the penetration of the roots of plants in search of nourishment. Air does not go below the water line. Heat descends very slowly through water. In the spring the feeble rays of the sun can scarcely penetrate our undrained soils, and cultivation is long delayed. But drained soils are porous and dry and warm, and weeks of additional growth is gained by the cultivator. From its friable nature, the soil is more easily tilled; for the same reason, the rains instead of carrying off the

ELEMENTS OF FERTILITY

from the surface by flowing in channels, percolate through the open soil, carrying with them carbonic acid and ammonia to be appropriated by the roots of the plants, or to be stored in the soil in combination with other elements of fertility; again, the porosity of the soil being thus secured, the excess of heat in periods of drouth passes off during the summer nights, and the air entering parts with its moisture to the soil and the severity of the drouth is always lessened. So we find that underdrained soils, are drier in wet seasons, and more supplied with moisture in dry seasons than similar soils not thus drained. To all who reflect, these truths will have the greatest significance, for we thus secure a rapid and luxuriant growth of vegetation when it is most needed. I suppose that it would not be extravagant to say, that three fourths of all the land now under cultivation, is in urgent need of underdraining.

The unscientific man who would make an aquarium for the adornment of his house, will succeed in his object. He will also keep it in operation, if he is constant in his attention. He will have it beautified with rock-castles, or castellated fortresses; he will provide proper shelter for the fishes when it rains; he will decorate the pebbles at the bottom with shining quartz and metallic crystals; he will see that the glass sides and rocks are frequently cleaned of the slimy

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green covering which will form, and then the gold-fishes will live, if the water is frequently changed; but if the water is not so changed, the fish will die for the want of oxygen. The man of science who would develop an aquarium, gets water from the brook or pond, which is filled with animalculas and germs of life, both vegetable and animal. He then seeks water plants, whose function it is to give off large quantities of oxygen. These are rooted in the tank. He is soon delighted with the sight of myriads of tiny globules from every point of every plant. These he knows to be indispensable to the life of the fishes he will soon introduce. Not satisfied with plants thus supplied for the production of oxygen, he carefully preserves the green covering of the glass and stones which soon forms under the influence of the light, for he knows that these are minute

WATER PLANTS,

which are most active in the production of aeration necessary for animal life. Then this animal life is supplied; at first little, afterwards more. A vast variety of minute animal forms of life are developed from the germs first introduced, and from those attached to the plants, until the aquarium will swarm with life. A perfect balance will be established between the vegetable and animal life, each supplying the wants of the other. The water need not be changed, and the aquarium is a "thing of beauty and a joy forever." It is more than this; it is a well balanced, self-sustaining microcosm; a little world, most instructive as well as beautiful, for it enables one to see the development of so many forms of life, which can never be understood and admired so perfectly from description or from books, as by the daily observation of them "with your own eyes." Now, the balancing of the life of the farm is the problem which the intelligent agriculturist sets before him. The man who, by great labor and constant application of costly manures, achieves great results, does well, but the man who balances his crops against each other, so that one takes what the other does not need, does better; and the man who so crops his farm, so that one crop *supplies* what the others need, and

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so balances his vegetable and animal life that the greatest amount of needed elements of fertility are most easily restored to the farm, and the produce actually taken off, impoverishes the soil least, and yet has the greatest money value, does best of all; for he comes the nearest of all to making his farm self-sustaining. This can be done as surely with the farm as with the aquarium, but the man who would do it must understand so much that it daunts one even to tell it. No one, however, need be daunted, as the building of a noble mansion must be done brick by brick, and stone by stone, so the development of the intelligent, all-comprehending mind of the farmer, who makes his work a reasonable process and a

PROFOUNDLY INTERESTING PROBLEM,

in which he sees the end from the beginning—is a slow process, but it is constantly its own reward. To do this he must know the nature of his soils, the elements of his crops, the chemistry of his manures and their relation to his crops; he must understand animal physiology, especially that of nutrition, the chemistry of foods, their relation to animal requirements, and he must also know the relation these foods bear to manures. All this requires an active, determined and comprehensive mind. But this knowledge once gained, make the true, permanent capital of the farmer. This capital can neither be stolen, alienated, or locked up. The more it is used the more valuable it becomes, and the faster it accumulates. The possession of this knowledge, or rather the well developed, educated man using this knowledge as material to control nature, and bring forth its wealth, is surely entitled to stand first among his fellows. He percieves the oneness, the universal relationship of truth. He should take rank, and *will* in the good time coming, above the soldier, who destroys; above the merchant who distributes; for he alone creates, and Liebig has said "perfect agriculture is the true foundation of all trade and industry; is the foundation of the

"RICHEST STATES,"

but let us ever bear in mind, that only by the best and most widely spread education, can agriculturists occupy that

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high position among men which is their proper place. The present year has been a generally prosperous one; without any wonderful advancement in any one branch of business, there has been steady, healthy growth in most departments; it compares favorably with other years. There are but few clouds on the horizon which threaten agricultural progress. The great enemy is ignorance, the *sine qua non* is education. One great evil however, should be noticed: it is the great facility with which individuals and corporations possess themselves of the

PUBLIC DOMAIN.

This land is the heritage of our own citizens. It shall be possessed by those only who become citizens of the Republic, and that in such reasonable amounts as may be profitably worked and developed by those who hold them. Instead of this, these lands are rapidly passing, in immense tracts, into the hands of individuals, both native and foreign, and corporations and foreign syndicates, to lie undeveloped until they can be sold to great profit at the will of the holders to our own citizens, who are now the rightful owners. It is the imperative duty of the national legislature to prevent this wholesale appropriation of our public lands. To awaken the attention of our people to this matter, I quote from a partial list of alien possessors, and the amounts of their holdings. These figures are impressive, and cannot be too often brought to the notice of the thinking public. The following are a few of the principal holders:

	Acres.
An English syndicate, No. 3, in Texas	3,000,000
The Holland Land Company, in New Mexico	4,500,000
Sir Edward Reed and syndicate, in Florida	2,000,000
Marquis of Tweesdale	1,750,000
Phillips, Marshall & Co., London	1,800,000
German syndicate	1,100,000
Anglo-American syndicate, London	750,000
Bryant H. Evans, of London' in Mississippi	700,000
M. Ellerhauser, of Halifax, in West Virginia	600,000
A Scotch syndicate, in Florida	500,000
And other foreign holdings bring up this amount to	20,647,000

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We supplement the above list by a few, and only a few of our own citizens, who are said to have already secured to themselves

BARONIAL POSSESSIONS:

	Acres.
C. F. Brainard, of Brainard, Minn.	140,000
George Hurst, of San Francisco, Cal.	48,000
S. C. Sherwin, in New Mexico	600,000
C. W. Dorsey and syndicate, New Mexico	3,500,000
Oliver Dalrymple, St. Paul, Minn.	500,000
H. Distin, of Philadelphia	2,000,000
J. W. Watkins, Louisiana	1,225,000
M. Richmond & Co., Buffalo	150,000
Jeremiah M. Rusk and other of our citizens swell this partial list to	8,580,000

In closing this address, let me, farmers of Wisconsin, call your attention to our own noble state, with all its advantages. Taking all things into consideration, there is no state in all this great nation which is to be preferred. Note its great extent of coast, favoring water transit to the east and south, its liberal system of railways, bringing to us the wealth of the west; the general fertility of its varied soils, its great stores of lumber, and of the metals, the average character of its temperature, reaching neither extreme, and its general healthfulness. Time would indeed fail to speak of our many blessings, for which we can never be too thankful, and as evidence of its productiveness in grain, stock, dairy products, etc., we have only to look around upon our fair this day. We know that it cannot be surpassed at any state fair in the Union. The vast display of farm machinery and manufactured articles shows the healthful nature of our industrial development. By the favor of the Almighty comes this blessing on our varied labors, and without His favor all our labor, and even our education, would be vain and profitless. This is no

GREAT BABYLON

which we have builded, it is a land overflowing with wealth and beauty, given by the great maker, who has also given the

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powers and aspirations needed for its development, and who requires of us obedience and gratitude.

Here I must stop, leaving many topics I had designed to treat, untouched.

Thanking you for your patient hearing, hoping you may realize the full measure of your expectations, I now declare this, the thirty-first annual exhibition of the Wisconsin State Agricultural Society, formally opened to the public.

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PREMIUMS AWARDED.

DEPARTMENT A — HORSES.

CLASS 1 — *Roadsters.*

Best stallion 4 years old and over, 16 entries, W. D. Crockett Waukegan, Ill	$25 00
Second best, David Johnson, Jefferson,	15 00
Best stallion 3 years old and under 4, 6 entries, J. I. Case, Racine, Wis	25 00
Second best, Barber Randall, Hustisford,	10 00
Best stallion 2 years old and under 3, 10 entries, H. L. Dousman, Prairie du Chien,	15 00
Second best, W. M. Osmond, Milwaukee, Wis	10 00
Best stallion 1 year old and under 2, 7 entries, W. D. Crockett, Waukegan, Ill	10 00
Second best, David Johnson, Jefferson,	5 00
Best sucking stallion foal, 2 entries, Byron Rowe, Milwaukee	10 00
Best brood mare 4 years old and over, with foal by her side, 5 entries, Byron Rowe, Milwaukee	15 00
Second best, H. G. Loomis, Waunakee	10 00
Best filly 3 years old and under 4, 5 entries, Henry Campbell, Evansville	15 00
Second best, S. D. Macomber, New Lisbon	10 00
Best filly 2 years old and under 3, 6 entries, L. B. Leonard, Lake Mills	15 00
Second best, Fred. Cramer, Windsor	10 00
Best filly 1 year old and under 2, 7 entries, L. B. Leonard, Lake Mills	10 00
Second best, Alf. Merrill, Madison	5 00
Best sucking filly foal, 4 entries, Barber Randall, Hustisford	10 00
Second best, S. D. Macomber, New Lisbon	5 00
Best stallion and 5 of his colts, at 4 years of age or under, in harness or not, at option of the owner, 2 entries, S. D. Macomber, New Lisbon	S. P. 25 00

CLASS 2 — *Horses for Work.*

Best stallion 4 years old and over, 6 entries, John C. ——, Lodi	$15 00
Second best, Lyall & Beattie, Verona	7 00
Best stallion 3 years old and under 4, 6 entries, L. C. Morse, Sparta,	12 00
Second best, Reuben Boyce, Brooklyn	6 00
Best stallion 2 years old and under 3, 1 entry, August Priem, Dane Station	8 00
Best stallion 1 year old and under 2, 1 entry, Jerome Bixby, Stoughton	5 00
Best sucking stallion foal, 3 entries, Burrington Bros., Sun Prairie,	4 00
Second best, Lyall & Beattie, Verona	2 00
Best brood mare 4 years old and over, with foal by her side, or evidence that she has had a foal within 2 years, 15 entries, Robert Caldwell, Arlington	15 00

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Second best, Jerome Bixby, Stoughton $7 00
Best filly, 3 years old and under 4, 9 entries, Lyall & Beattie, Verona 12 00
Second best, Burrington Bros., Sun Prairie 6 00
Best Filly, 2 years old and under 3, 6 entries, Bowles & Hadden, Janesville 8 00
Second best, Burrington Bros., Sun Praire 4 00
Best Filly, 1 year old and under 2, 4 entries, Burrington Bros., Sun Prairie 5 00
Second best, Robert Caldwell, Arlington 2 00
Best sucking filly foal, 7 entries, John Sprecher & Sons, Madison .. 4 00
Second best, Robert Caldwell, Arlington 2 00

CLASS 3 — *American Highly Bred Trotting Stock with Pedigrees.*

Best stallion of any age, 8 entries, H. L. Dousman, Prairie du Chien ..... Grand Silver Medal
Best stallion, 4 years and over, 3 entries, H. L. Dousman, Prairie du Chien ..... Diploma
Best stallion, 3 years old and under 4, 4 entries, J. W. Blackford Juda ..... Diploma
Best stallion, 2 years old and under 3, 6 entries, H. L. Dousman, Prairie du Chien ..... Diploma
Best stallion, 1 year old and under 2, 4 entries, H. L. Dousman, Prairie du Chien ..... Diploma
Best sucking stallion foal, 1 entry, H. L. Dousman, Prairie du Chien ..... Diploma.
Best brood mare, 4 entries, H. L. Dousman. Prairie du Chien ..... Diploma.
Best filly 3 years old and under 4, 2 entries, H. L. Dousman, Prairie du Chien ..... Diploma.
Best filly 2 years old and under 3, 4 entries, H. L. Dousman, Prairie du Chien ..... Diploma.
Best filly 1 year old and under 2, 5 entries, H. L. Dousman, Prairie du Chien ..... Diploma.
Best sucking filly foal, 2 entries, H. L. Dousman, Prairie du Chien. Diploma.

CLASS 4.— *Draft Horses — Pure Bred.*

Best Clydesdale or English shire stallion 4 years old and over, 11 entries, Galbraith Bros. Janesville $25
Second best, W. M. Moffatt & Bro., Paw Paw, Ill 15
Best Norman stallion 4 years old and over, 8 entries, Rufus B. Kellogg, Green Bay 25
Second best, Bowles & Haden, Janesville 15
Best Clydesdale or English shire stallion 3 years old and under 4, 6 entries, Galbraith Bros., Janesville 25
Second best, Raeside Bros., Waukegan, Ill 10
Best Norman stallion 3 years old and under 4, 3 entries, J. W. Robinson, Leeds Center 25
Second best, Bowles & Hadden, Janesville 10
Best stallion 2 years old and under 3, 16 entries, Galbraith Bros., Janesville 20 00
Second best, Galbraith Bros., Janesville 10 00
Best stallion 1 year old and under 2, 4 entries, W. Moffats, Paw Paw, Ill 10 00
Second best, W. Moffats, Paw Paw, Ill 5 00
Best sucking stallion foal, 2 entries, Raeside Bros., Waukegan, Ill. 10 00
Second best, Reuben Boyce, Brooklyn 5 00

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Best Norman mare 4 years old and over, 4 entries, Rufus B. Kellogg, Green Bay $15 00
Second best, Rufus B. Kellogg, Green Bay 10 00
Best Clyde mare 4 years old and over, 6 entries, W. Moffats & Bro., Paw Paw, Ill 15 00
Second best, Raeside Bros., Waukegan, Ill 10 00
Best filly 3 years old and under 4, 6 entries, W. Moffats & Bro., Paw Paw, Ill 15 00
Second best, Galbraith Bros., Janesville 10 00
Best filly 2 years old and under 3, 13 entries, Galbraith Bros., Janesville 15 00
Second best, Galbraith Bros., Janesville 10 00
Best filly 1 year old and under 2, 2 entries, Galbraith Bros., Janesville 10 00
Second best, Raeside Bros., Waukegan, Ill 5 00
Best sucking filly foal, 3 entries, Raeside Bros., Waukegan, Ill 10 00
Second best, John Sprecher, Madison 5 00
Best stallion and five of his get, 2 entries. Lyall & Beattie, Verona, Wis ..... S. P. $40 00
Second best, Lyall & Beattie, Verona ..... S. P. 20 00

CLASS 5—*Matched Horses and Mares.*

Best pair of carriage horses or mares, 10 entries, N. B. Van Slyke, Madison ..... S. P. 20 00
Second best, J. B. Hull, Evansville ..... S. P. 10 00
Best pair of roadsters, 16 entries, J. S. Hutson, Stoughton .... S. P. 20 00
Second best, Geo. E. Smith, Werley ..... S. P. 10 00
Best pair of farm horses, 12 entries ..... Protested.
Best pair of draft horses, 5 entries, W. Moffat's & Bro., Paw Paw, Illinois ..... S. P. 20 00
Second best, Raeside Bros, Waukegan, Ill ..... S. P. 10 00

CLASS 6—*Geldings or Mares for Single Harness and Thoroughbreds.*

Best gentleman's roadster, for single harness, 4 years old and over, 15 entries, David Johnson, Jefferson ..... S. P. 20 00
Second best. H. L. Dousman, Prairie du Chien ..... S. P. 10 00
Best thoroughbred stallion, any age, to be shown by bridle, 1 entry, W. H. Cook, West Point ..... S. P. 20 00
Best thoroughbred mare any age to be shown by the bridle, 1 entry, Dr. C. L. Martin, Janesville ..... S. P. 15 00
Best gentleman's riding horse, 5 entries, Gerd. Debower, Dane Station ..... Diploma

Sweepstakes.

Best stallion and 5 mares, same breed, bred and owned in Wisconsin, 2 entries, Reuben Boyce, Brooklyn $50 00
Best stallion and 5 mares, same breed, open to the world, 6 entries Raeside Bros., Waukegan, Ill 50 00
Best stallion any age or breed, open to the world, 32 entries, H. L. Dousman, (protested by Galbraith Bros.) ..... Grand Gold Medal and Diploma
Best mare, any age or breed, open to the world, 31 entries, W. Moffats & Bro., Paw Paw, Ill ..... Grand Gold Medal and Diploma

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DEPARTMENT B — CATTLE.

CLASS 8 — *Short Horns.*

Best bull 3 years old and over, 8 entries, Robert Miller, West Liberty, Iowa	$20 00
Second best, S. S. Brown's Sons, Galena, Ill	10 00
Best bull 2 years old and under 3, 2 entries J. C. Kiser, Oregon	20 00
Best bull 1 year old and under 2, 7 entries, Seth Fisher, Centre	15 00
Second best, John Sprecher & Sons, Madison	10 00
Best bull calf over 6 and under 12 months old, 4 entries, Robert Miller, West Liberty, Iowa	10 00
Second best, J. C. Kiser, Oregon	5 00
Best bull calf under 6 months old, 7 entries, Seth Fisher, Centre	10 00
Second best, J. C. Kiser, Oregon	5 00
Best cow 3 years old and over, 15 entries, Robert Miller, West Liberty, Iowa	15 00
Second best, Robert Miller, West Liberty, Iowa	10 00
Best heifer 2 years old and under 3, 11 entries, Robert Miller, West Liberty, Iowa	15 00
Second best, S. S. Brown's Son's, Galena, Ill	5 00
Best heifer 1 year old and under 2, 15 entries, Robert Miller, West Liberty, Iowa	15 00
Second best, Robert Miller, West Liberty, Iowa	10 00
Best heifer calf over 6 and under 12 months old, 8 entries, Robert Miller, West Liberty, Iowa	10 00
Second best, S. S. Brown's Sons, Galena, Ill	5 00
Best heifer calf under 6 months old, 6 entries, Robert Miller, West Liberty, Iowa	10 00
Second best, J. C. Kiser, Oregon	5 00
Display in entire class, Robert Miller, West Liberty, Iowa	25 00

CLASS 9 — *Jerseys.*

Best bull, 3 years old and over, 3 entries, J. T. Wright, Janesville.	20 00
Second best, Geo. Thatcher, Black Earth	10 00
Best bull, 2 years old and under 3, 1 entry, J. B. Stone, Oregon	20 00
Best bull, 1 year old and under 2, 2 entries, C. B. Miller, Madison	15 00
Second best, D. Mosher Beloit	10 00
Best bull calf, over 6 and under 12 months, 6 entries, C. B. Miller, Madison	10 00
Second best, C. B. Miller, Madison	5 00
Best bull calf under 6 months old, 3 entries, C. B. Miller, Madison	10 00
Second best, C. B. Miller, Madison	5 00
Best cow 3 years old and over, 4 entries, George Thatcher, Black Earth	15 00
Second best, C. B. Miller, Madison	10 00
Best heifer 2 years old and under 3, 1 entry, J. T. Wright, Janesville	15 00
Best heifer, 1 year old and under 2, 5 entries, C. B. Miller, Madison	15 00
Second best, C. B. Miller, Madison	10 00
Best heifer calf under 6 months old, 2 entries, C. B. Miller, Madison	10 00
Second best, J. T. Wright, Janesville	5 00
Best display in entire class, 1 entry, C. B. Miller, Madison	25 00

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CLASS 10 — *Ayrshires — No entries.*

CLASS 11 — *Devons.*

Best bull 3 years old and over, 3 entries, J. W. Morse & Son, Verona	$20 00
Second best, Geo. Baker & Son, Hustisford	10 00
Best bull 2 years old and under 3, 1 entry, Geo. Baker & Son, Hustisford	20 00
Best bull 1 year old and under 2, 1 entry, J. W. Morse & Son, Verona	15 00
Best bull calf over 6 and under 12 months old, three entries, J. W. Morse & Son, Verona	10 00
Second best, J. W. Morse & Son, Verona	5 00
Best bull calf under 6 months old, 5 entries, J. W. Morse & Son, Verona	10 00
Second best, Geo. Baker & Son, Hustisford	5 00
Best cow 3 years old and over, 10 entries, J. W. Morse & Son, Verona	15 00
Second best, Geo. Baker & Son, Hustisford	10 00
Best heifer 2 years old and under 3, 6 entries, Geo. Baker & Son, Hustisford	15 00
Second best, J. W. Morse & Son, Verona	10 00
Best heifer 1 year old and under 2, 8 entries, Geo. Baker & Son, Hustisford	15 00
Second best, J. W. Morse & Son, Verona	10 00
Best heifer calf over 6 and under 12 months old, 3 entries, J. W. Morse & Son, Verona	10 00
Second best, J. W. Morse & Son, Verona	5 00
Best heifer calf under 6 months old, 3 entries, Geo. Baker & Son, Hustisford	10 00
Second best, J. W. Morse & Son, Verona	5 00
Best display in entire class, 2 entries, Geo. Baker & Son, Hustisford.	25 00

CLASS 12.—*Galloways and Polled Angus or Polled Norfolks.*

Best bull 3 years old and over, 2 entries, Anderson & Findlay, Lake Forest, Ill	$20 00
Best bull 2 years old and under 3, 6 entries, Anderson & Findlay, Lake Forest, Ill	20 00
Second best, Anderson & Findlay, Lake Forest, Ill	10 00
Best bull 1 year old and under 2, 2 entries, Anderson & Findlay, Lake Forest, Ill	15 00
Second best, S. H. & A. E. Joiner, Janesville	10 00
Best bull calf over 6 and under 12 months old, 1 entry, Geo. Abbott & Sons, Woodstock, Ill	10 00
Best bull calf under 6 months old, 1 entry, Geo. Abbott & Sons, Woodstock, Ill	10 00
Best cow 3 years old and over, 7 entries, Anderson & Findlay, Lake Forest, Ill	15 00
Second best, Anderson & Findlay, Lake Forest, Ill	10 00
Best heifer 2 years old and under 3, 3 entries, Anderson & Findlay, Lake Forest, Ill	15 00
Second best, Anderson & Findlay, Lake Forest, Ill	10 00
Best heifer 1 year old and under 2, 6 entries, Anderson & Findlay, Lake Forest, Ill	15 00
Second best, Anderson & Findlay, Lake Forest, Ill	10 00

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Best heifer calf over 6 and under 12 months old, 2 entries, Anderson & Findlay, Lake Forest, Ill..... $10 00
Second best, Anderson & Findlay, Lake Forest, Ill..... 5 00
Best heifer calf under 6 months old, 1 entry, Wm. Steele, Merton. 10 00
Best display in entire class, 1 entry, Anderson & Findlay, Lake Forest, Ill..... 25 00

CLASS 13 — *Herefords—No Entries.*

CLASS 14 — *Holsteins.*

Best bull 3 years old and over, 6 entries, S. S. Mann & Son, Elgin, Ill..... $20 00
Second best, Heath Brothers, Madison..... 10 00
Best bull 2 years old and under 3, 5 entries, Vanderhoff & Cobb, Bloomington..... 20 00
Second best, Gillett & Moore, Rosendale..... 10 00
Best bull 1 year old and under 2, 10 entries, F. W. Maxon, Walworth..... 15 00
Second best, J. F. Jackson, Marshall..... 10 00
Best bull calf over 6 and under 12 months old, 7 entries, Vanderhoff & Cobb, Bloomington..... 10 00
Second best, T. W. Laramie, Beloit..... 5 00
Best bull calf under 6 months old, 15 entries, F. W. Maxon, Walworth..... 10 00
Second best, Heath Brothers, Madison..... 5 00
Best cow 3 years old and over, 23 entries, S. S. Mann & Sons, Elgin, Ill..... 15 00
Second best, Gillett & Moore, Rosendale..... 10 00
Best heifer 2 years old and under 3, 14 entries, S. S. Mann & Son, Elgin, Ill..... 15 00
Second best, T. W. Laramie, Beloit..... 10 00
Best heifer 1 year old and under 2, 12 entries, Heath Bros., Madison..... 15 00
Second best, S. S. Mann & Son, Elgin, Ill..... 10 00
Best heifer calf, over 6 and under 12 months old, 6 entries, Gillett & Moore, Rosendale..... 10 00
Second best, F. W. Maxon, Walworth..... 5 00
Best heifer calf, under 6 months old, 5 entries, T. W. Laramie, Beloit..... 10 00
Second best, F. W. Maxon, Walworth..... 5 00
Best display in entire class, 6 entries, S. S. Mann & Son, Elgin, Ill.. 25 00

CLASS 15 — *Guernseys — No Entries.*

CLASS 16 — *Fat Cattle, 2 Entries — No Award.*

Sweepstakes.

Best bull with 4 females, age not considered, 15 entries, Robert Miller, West Liberty, Iowa..... $60 00
Second best, Anderson & Findlay, Lake Forest, Ill..... 40 00
Best bull calf and 4 heifer calves, bred and owned by exhibitor, 4 entries, Robert Miller, Liberty, Iowa.....S. P. 30 00
Second best, J. C. Kiser, Oregon.....S. P. 20 00

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Best bull and three of his get, 6 entries. Robert Miller, West Liberty, Iowa	S. P.	$25 00
Best cow and 3 of her calves, 5 entries, J. C. Kiser, Oregon	S. P.	25 00

DEPARTMENT C.—SHEEP.

CLASS 17—*American Merinos.*

Best buck 2 years old and over, 4 entries, R. H. Mill, Palmyra		12 00
Second best, J. N. Crawford, Mugwanago		7 00
Best buck 1 year old and under 2, 9 entries, J. N. Crawford, Mukwanago		12 00
Second best, R. H. Mill, Palmyra		7 00
Best pen 3 buck lambs, 2 entries, J. N. Crawford, Mukwanago		7 00
Second best, R. H. Mill, Palmyra		3 00
Best pen 3 ewes, 2 years old and over, 4 entries, J. N. Crawford, Mukwanago		12 00
Second best, R. H. Mill, Palmyra		7 00
Best pen 3 ewes 1 year old and under 2, 3 entries, R. H. Mill, Palmyra		12 00
Second best, J. N. Crawford, Mukwanago		7 00
Best pen of 3 ewe lambs, 3 entries, J. N. Crawford, Mukwanago		7 00
Second best, R. H. Mill, Palmyra		3 00
Best buck and 5 ewes (winners of above excluded), 2 entries, J. H. Pitcher, Eagle	S. P.	15 00

CLASS 18—*American Merinos and all others not eligible in class* 17.

Best buck 2 years old and over, 9 entries, J. H. Pitcher, Eagle		$12 00
Second best, Frazer & Lobdell, Mukwanago		7 00
Best buck 1 year old and under 2, 11 entries, J. H. Pitcher, Eagle		12 00
Second best, Frazer & Lobdell, Mukwanago		7 00
Best pen 3 buck lambs, 2 entries, J. H. Pitcher, Eagle		7 00
Second best, J. H. Pitcher, Eagle		3 00
Best pen 3 ewes 2 years old and over, 3 entries, J. H. Pitcher, Eagle		12 00
Second best, Geo. Baker & Son, Hastisford		7 00
Best pen 3 ewes 1 year old and under 2, 3 entries, Geo. Baker & Son, Hustisford		12 00
Second best, J. H. Pitcher, Eagle		7 00
Best pen 3 ewe lambs, 2 entries, J. H. Pitcher, Eagle		7 00
Second best, J. H. Pitcher, Eagle		3 00
Best buck and 5 of his get (winners of above excluded), 2 entries. J. H. Pitcher, Eagle	S. P.	15 00

CLASS 19—*Long Wool.*

Best buck 2 years old and over, 8 entries, T. Morgan, Camargo, Ill.		$12 00
Second best, Geo. Stevenson, Darlington		7 00

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Best buck 1 year old and under 2, 9 entries, Jas. O'Malley, Waunakee	$12 00
Second best, Geo. Harding, Waukesha	7 00
Best pen 3 buck lambs, 7 entries, Geo. Harding, Waukesha	7 00
Second best, Geo. Stevenson, Darlington	3 00
Best pen 3 ewes, 2 years old and over, 9 entries, T. Morgan, Camargo, Ill	12 00
Second best, Geo. Harding, Waukesha	7 00
Best pen 3 ewes 1 year old and under 2, 8 entries, T. Morgan, Camargo, Ill	12 00
Second best Geo. Harding, Waukesha	7 00
Best pen 3 ewe lambs, 8 entries, Jos. O'Malley, Waunakee	7 00
Second best, Geo. Stevenson, Darlington	3 00
Best buck with 5 of his get, winners of above excluded, 4 entries, T. Morgan, Camargo, Ill ..... S. P.	15 00

CLASS 20 — *Downs.*

Best buck 2 years old and over, 7 entries, F. C. Goldsborough, Easton, Talbot county, Md	$12 00
Second best, Chas. Collard, Edmund	7 00
Best buck 1 year old and under 2, 9 entries, F. C. Goldsborough, Easton, Maryland	12 00
Second best, T. Morgan, Camargo, Ill	7 00
Best pen 3 buck lambs, 10 entries, Eugene Hatch, Owatonna, Minn.	7 00
Second best, Geo. S. Daubner, Brookfield Center	3 00
Best pen 3 ewes 2 years old and over, 11 entries, F. C. Goldsborough, Easton, Maryland	12 00
Second best, Eugene Hatch, Owatonna, Minn	7 00
Best pen 3 ewes 1 year old and under 2, 8 entries, F. C. Goldsborough, Easton, Maryland	12 00
Second best, Eugene Hatch, Owatonna, Minn	7 00
Best pen 3 ewe lambs, 9 entries, Chas. Collard, Edmund	7 00
Second best, Geo. S. Daubner, Brookfield Center	3 00
Best buck and 5 of his get (winners of above excluded), 3 entries, Eugene Hatch ..... S. P.	15 00
Best 3 fat wethers, 1 year old and under 2, 1 entry, Geo. Stevenson, Darlington ..... S. P.	10 00

DEPARTMENT D—SWINE.

CLASS 21—*Large Breeds—Poland China.*

Best boar 2 years old and over, 2 entries, Hook Bros. Brooklyn	$12 00
Second best, E. I. Austin, Beloit	8 00
Best boar 1 year old and under 2, 2 entries, E. Wait & Son, LaGrange	6 00
Second best, Hook Bros, Brooklyn	4 00
Best breeding sow 2 years old and over, 4 entries, E. Wait & Son La Grange	10 00
Second best, E. I. Austin Beloit	8 00
Best breeding sow 1 year old and under 2, 2 entries, Reuben Boyce, Brooklyn	7 00
Second best, A. A. Munger, Brooklyn	4 00
Best boar pig over 6 mos. old and under 1 year, 4 entries, E. Wait & Son, La Grange	6 00
Second best, E. Wait & Son, La Grange	3 00

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Best sow pig over 6 mos and under 1 year old, 2 entries, E. Wait & Son, La Grange $6 00
Best boar pig under 6 months old, 18 entries, E. Wait & Son, La Grange 6 00
Second best, E. I. Austin, Beloit 3 00
Best sow pig under 6 months old, 14 entries, E Wait & Son, La Grange 6 00
Second best, Reuben Boyce, Brooklyn 3 00

Herd Sweepstakes.

Best boar, any age, 5 entries, E. Wait & Son, La Grange 10 00
Best sow, any age, 6 entries, E. Wait & Son, La Grange 10 00

CLASS 22 — *Large Breeds — Chester White and Others.*

Best boar 2 years old and over, 2 entries, Geo. F. Davis, Dyer, Ind. $12 00
Second best, R. B. Clark, Beloit 8 00
Best boar 1 year old and under 2, 1 entry, E. R. Bement, Oregon .. 6 00
Best breeding sow 2 years old and over, 3 entries, Geo. F. Davis, Dyer, Ind 10 00
Second best, Geo. F. Davis, Dyer, Ind 8 00
Best breeding sow, 1 year old and under 2, 5 entries, Geo. F. Davis, Dyer, Ind 7 00
Second best, Geo. F. Davis, Dyer, Ind 4 00
Best breeding sow with litter of sucking pigs not less than 4, 6 entries, E. R. Bement, Oregon 10 00
Second best, R. B. Clark, Beloit 8 00
Best boar pig over 6 months and under 1 year old, 6 entries, Geo. F. Davis, Dyer, Ind 6 00
Second best, Geo. F. Davis, Dyer, Ind 3 00
Best sow pig over 6 months and under 1 year old, 4 entries, Geo. F. Davis, Dyer, Ind 6 00
Second best, Geo. F. Davis, Dyer, Ind 3 00
Best boar pig under 6 months old, 11 entries, J. E. Owens, Brooklyn 6 00
Second best, R. B. Clark, Beloit 3 00
Best sow pig under 6 months old, 7 entries, Geo. F. Davis, Dyer, Ind 6 00
Second best, Geo. F. Davis, Dyer, Ind 3 00

Herd Sweepstakes.

Best boar any age, 5 entries, Geo. F. Davis, Dyer, Ind 10 00
Best sow any age, 8 entries, Geo. F. Davis, Dyer, Ind 10 00

CLASS 23 — *Middle Breeds — Berkshire.*

Best boar 2 years old and over, 2 entries, J. E. Owens, Brooklyn .. 12 00
Second best, Wm. Forrest, Poyne te 8 00
Best boar 1 year old and under 2, 6 entries, J. E. Owens, Brooklyn. 6 00
Second best, Barber Randall, Hustisford 4 00
Best breeding sow 2 years old and over, 3 entries, J. E. Owens, Brooklyn 10 00
Second best, J. E. Owens, Brooklyn 8 00

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Best breeding sow 1 year and under 2, 4 entries, R. H. Gage, Whitewater $7 00
Second best, Barber Randall, Hustisford 4 00
Best breeding sow with litter of sucking pigs, not less than 4, 2 entries, J. E. Owens, Brooklyn 10 00
Second best, F. A. Bird, Madison 8 00
Best boar pig over 6 months old and under 1 year, three entries, J. E. Owens, Brooklyn 6 00
Second best, R. H. Gage, Whitewater 3 00
Best sow pig over 6 months old and under 1 year, 7 entries, J. E. Owens, Brooklyn 6 00
Second best, Lytle & Merriman, Elkhorn 3 00
Best boar pig under 6 months old, 14 entries, J. E. Owens, Brooklyn 6 00
Second best, R. H. Gage, Whitewater 3 00
Best sow pig under 6 months old, 21 entries, J. E. Owens, Brooklyn 6 00
Second best Lytle & Merriman, Elkhorn 3 00

Herd Sweepstakes.

Best boar any age, 5 entries, J. E. Owens, Brooklyn 10 00
Best sow any age, 4 entries, J. E. Owens, Brooklyn 10 00

CLASS 24 — *Small Breeds — Essex, Suffolk and Others.*

Best boar, 2 years old and over, 2 entries, S. H. and A. E. Joiner, Janesville 12 00
Second best S. H. and A. E. Joiner, Janesville 8 00
Best boar, 1 year old and under 2, 2 entries, S. H. and A. E. Joiner, Janesville 6 00
Second best, S. H. and A. E. Joiner, Janesville 4 00
Best breeding sow, 2 years old and over, 2 entries, S. H. and A. E. Joiner, Janesville 10 00
Second best, S. H. and A. E. Joiner, Janesville 8 00
Best breeding sow, 1 year old and under 2, 2 entries, S. H. and A. E. Joiner, Janesville 7 00
Second best, S. H. and A. E. Joiner, Janesville 4 00
Best breeding sow with litter of sucking pigs, not less than 4, 1 entry, S. H. and A. E. Joiner, Janesville 10 00
Best sow pig over 6 months and under 1 year old, 2 entries ..... No award
Best boar pig under 6 months old, 2 entries, S. H. and A. E. Joiner, Janesville 6 00
Second best, S. H. and A. E. Joiner, Janesville 3 00
Best sow pig under 6 months old, 2 entries, S. H. and A. E. Joiner, Janesville 6 00
Second best, S. H. and A. E. Joiner, Janesville 3 00

Herd Sweepstakes.

Best boar any age, 3 entries, S. H. and A. E. Joiner, Janesville 10 00
Best sow any age, 3 entries, S. H. and A. E. Joiner, Janesville 10 00

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DEPARTMENT E—POULTRY.

CLASS 25—*Asiatics—Light Brahmas.*

Best trio Light Brahma (fowls), 11 entries, Chas. H. Belding, Shopiere	$2 50
Second best, R. B. Clark, Beloit	1 50
Best trio Light Brahma (chicks), 11 entries, Geo. Harding, Waukesha	2 00
Second best, Miss Elsie Baker, Madison	1 00
Best trio Dark Brahma (fowls), 4 entries, J. R. Brabazon, Delavan	2 50
Second best, R. B. Clark, Beloit	1 50
Best trio Dark Brahma (chicks), 2 entries, J. R. Brabazon, Delavan	2 00
Second best, Chas. Belding, Shopiere	1 00
Best trio Buff Cochin (fowls), 6 entries, Mrs. H. E. Munger, Brooklyn	2 50
Second best, R. B. Clark, Beloit	1 50
Best trio Buff Cochin (chicks), 4 entries, J. R. Brabazon, Delavan	2 00
Second best, Mrs. H. E. Munger, Brooklyn	1 00
Best trio Partridge Cochin (fowls), 8 entries, R. B. Clark, Beloit	2 50
Second best, J. R. Brabazon, Delavan	1 50
Best trio Partridge Cochin (chicks), 13 entries, R. B. Clark, Beloit	2 00
Second best, J. R. Brabazon, Delavan	1 00
Best trio White Cochin (fowls), 3 entries, Mrs. H. E. Munger, Brooklyn	2 50
Second best, E. Wilson, Lake Mills	1 50
Best trio White Cochin (chicks), 3 entries, J. R. Brabazon, Delavan	2 00
Second best, E. Wilson, Lake Mills	1 00
Best trio American Dominique (fowls), 3 entries, J. R. Brabazon, Delavan	2 50
Second best, Chas. H. Belding, Shopiere	1 50
Best trio American Dominique (chicks), 3 entries, Chas. H. Belding, Shopiere	2 00
Second best, A. W. Spaulding, Brooklyn	1 00
Best trio Plymouth Rock (fowls), 13 entries, R. B. Clark, Beloit	2 50
Second best, Miss Elsie Baker, Madison	1 50
Best trio Plymouth Rock (chicks), 12 entries, Geo. Harding, Waukesha	2 00
Second best, W. T. Baker, Evansville	1 00
Best trio Dorking (fowls)	No entries.
Best trio Dorking (chicks), 1 entry	No award.
Best trio Langshan (fowls), 5 entries, Mrs. H. E. Munger, Brooklyn	2 50
Second best, Jas. D. Cass, Beloit	1 50
Best trio Langshan (chicks), 3 entries, Mrs. H. E. Munger, Brooklyn	2 00
Second best, J. R. Brabazon, Delavan	1 00

Spanish.

Best trio Black Spanish (white face) fowls, 5 entries, Mrs. H. E. Munger, Brooklyn	$2 50
Second best, R. B. Clark, Beloit	1 50
Best trio Black Spanish chicks, 5 entries, Chas. H. Belding, Shopiere	2 00
Second best, Mrs. H. E. Munger, Brooklyn	1 00
Best trio White Leghorn fowls, 4 entries, Chas. H. Belding, Shopiere	2 50
Second best, Mrs. H. E. Munger, Brooklyn	1 50

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Best trio White Leghorn chicks, 8 entries, Jas. D. Cass, Beloit... $2 00
Second best, R. B. Clark, Beloit..... 1 00
Best trio Brown Leghorn fowls, 8 entries, R. B. Clark, Beloit 2 50
Second best, Jas. D. Cass..... 1 50
Best trio Brown Leghorn chicks, 10 entries, R. B. Clark, Beloit.. 2 00
Second best, Mrs. H. E. Munger, Brooklyn..... 1 00
Best trio Black Hamburg fowls.....No entries.
Best trio Black Hamburg chicks, 1 entry, J. R. Brabazon, Delavan..... 2 00
Best trio Silver Spangled Hamburg fowls, 4 entries, Chas. H. Belding, Shopiere..... 2 50
Second best, J. R. Brabazon, Delavan..... 1 50
Best trio Silver Spangled Hamburg chicks, 8 entries, Chas. H. Belding, Shopiere..... 2 00
Best trio Silvered Spangled or Penciled Hamburg fowls, 1 entry, First premium not awarded.
Second best, E. Wilson, Lake Mills..... 1 50
Best trio Silver Spangled or Penciled Hamburg chicks .....No entries
Best trio Golden Spangled or Penciled Hamburg fowls, 1 entry, R. B. Clark, Beloit 2 50
Best trio Golden Spangled or Penciled Hamburg chicks .....No entries
Golden Spangled Hamburg fowls and chicks .....No entries

French.

Best trio Houdan fowls, 5 entries, R. B. Clark, Beloit $2 50
Second best, R. B. Clark, Beloit..... 1 50
Best trio Houdan chicks, 6 entries, Mrs. H. E. Munger, Brooklyn.. 2 00
Second best, Mrs. H. E. Munger, Brooklyn 1 00

Polish.

Best trio Black Polish, white crest fowls, 4 entries, J. R. Brabazon, Delavan $2 50
Second best, Mrs. H. E. Munger, Brooklyn 1 50
Best trio Black Polish white crest chicks, 8 entries, Mark Smith, Jr., Madison 2 00
Second best, Mrs. H. E. Munger, Brooklyn..... 1 00
Best trio White Polish fowls, 1 entry, E. Wilson, Lake Mills 2 50
Best trio White Polish chicks, 1 entry, J. R. Brabazon, Delavan... 2 00
Best trio Silver Polish fowls, 5 entries, Chas. H. Belding, Shopiere 2 50
Second best, Chas. H. Belding, Shopiere..... 1 50
Best trio Silver Polish chicks, 5 entries, Mrs. H. E. Munger, Brooklyn 2 00
Second best, Mrs. H. E. Munger, Brooklyn..... 1 00
Best trio Golden Polish fowls, 6 entries, Mrs. H. E. Munger, Brooklyn 2 50
Second best, J. R. Brabazon, Delavan..... 1 50
Best trio Golden Polish chicks, 4 entries, Mrs. H. E. Munger, Brooklyn 2 00
Second best, Mrs. H. E. Munger, Brooklyn..... 1 00

Bantams.

Best trio Golden Seabright fowls, 8 entries, J. R. Brabazon, Delavan 2 50
Best trio Golden Seabright chicks, 5 entries, J. R. Brabazon, Delavan 2 00
Second best, R. B. Clark, Beloit..... 1 00
Silver Duckwing fowls and Chicks ....No entries

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Best trio any other variety Bantan fowls, 3 entries, J. R. Brabazon Delavan	$2 50
Second best, Chas. H. Belding, Shopiere	1 50
Best trio any other variety Bantam chicks, 5 entries, Chas. H. Belding, Shopiere	2 00
Second best, J. R. Brabazon, Delavan	1 00

Game.

Best pair brown red game fowls, 2 entries, Chas. H. Belding, Shopiere	$2 50
Second best, E. Wilson, Lake Mills	1 50
Best pair brown red game chicks, 3 entries, E. Wilson, Lake Mills.	2 00
Second best, Chas. H. Belding, Shopiere	1 00
Best pair black breasted red game fowls, 4 entries, J. R. Brabazon, Delavan	2 50
Second best, R. B. Clark, Beloit	1 50
Best pair black breasted red game chicks, 4 entries, Chas. H. Belding, Shopiere	2 00
Second best, Jas. D. Cass, Beloit	1 00
Best pair Pyle fowls, 2 entries, E. Wilson, Lake Mills	2 50
Second best, E. Wilson, Lake Mills	1 50
Best pair Pyle chicks, 2 entries, J. R. Brabazon, Delavan	2 00
Second best, J. R. Rrabazon, Delavan	1 00
Best pair any other variety game fowls, 3 entries, E. Wilson, Lake Mills	2 50
Second best, E. Wilson, Lake Mills	1 50
Best pair any other variety game chicks, 4 entries, Chas. H. Belding, Shopiere	2 00
Second best, A. W. Spaulding, Brooklyn	1 00

Turkeys.

Best pair Bronze Turkey (fowls), 9 entries, Mrs. H. E. Munger, Brooklyn	$2 50
Second best, Chas. H Belding, Shopiere	1 50
Best pair Bronze Turkey (chicks), 9 entries, E. Wilson, Lake Mills.	2 00
Second best, E. Wilson, Lake Mills	1 00
Best pair Common Turkey (fowls), 3 entries, E. Wilson, Lake Mills	2 00
Second best, E. W. Palmer, Madison	1 00
Best pair Common Turkey (chicks), 1 entry, J. R. Brabazon, Delavan	1 50
Best pair Rocky Mountain or White Holland Turkey (fowls), 3 entries, J. R. Brabazon, Delavan	2 50
Second best, Chas. H. Belding, Shopiere	1 50
Best pair Rocky Mountain or White Holland Turkey (chicks, 2 entries, Chas. H. Belding, Shopiere	2 00
Second best, J. R. Brabazon, Delavan	1 00

Water Fowls.

Best pair geese, 10 entries, J. R. Brabazon, Delavan	$2 00
Second best, J. B. Hicks & Son, Mazomanie	1 00
Best pair Alexbury ducks, 6 entries, J. B. Hicks & Son, Mazomanie	2 00
Second best, J. B. Hicks & Son, Mazomanie	1 00
Best pair Rouen ducks, 8 entries, R. B. Clark, Beloit	2 00
Second best, J. R. Brabazon, Delavan	1 00
Best pair Muscovy ducks, 6 entries, J. R. Brabazon, Delavan	2 00
Second best, Chas. H. Belding, Shopiere	1 00
Best pair Cayuga ducks, 3 entries, J. R. Brabazon, Delavan	2 00

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Best pair Pekin ducks, 16 entries, Mrs. H. B. Munger, Brooklyn...	$2 00
Second best, R. B. Clark, Beloit.....	1 00
Best pair Pea fowls, 4 entries, S. Dunlap, Token Creek...	2 50
Second best, Chas. H. Belding, Shopiere.....	1 50
Best pair Guinea fowls, 6 entries, R. B. Clark, Beloit.....	2 50
Second best, Chas. H. Belding, Shopiere.....	1 50
Best pair Guinea chicks, 6 entries, Jas. D. Cass, Beloit.....	2 00
Second best, Chas. H. Belding, Shopiere.....	1 00
Best and greatest variety of poultry shown by one person, 4 entries, J. R. Brabazon, Delavan.....	5 00
Best exhibition of fancy pigeons, 2 entries, R. B. Clark, Beloit....	5 00
Second best, R. B. Clark, Beloit.....	3 00
Show of rabbits.....	No entries
Variety of pigeons and rabbits.....	No entries

Miscellaneous.

Best Black Cochin chicks, Mrs. H. E. Munger, Brooklyn	2 00
Second best, W. T. Baker, Evansville	1 00
Best Black Java chicks, 1 entry, Mrs. H. E. Munger, Brooklyn	2 00
Best Wyandotte fowls, 2 entries, R. B. Clark, Beloit.....	2 50
Best Wyandotte chicks, 4 entries, Mrs. H. E. Munger, Brooklyn...	1 00
Best pair African Bantam fowls, J. R. Brabazon, Delavan	2 50
Best pair African Bantam chicks, J. R. Brabazon, Delavan.....	2 00
Second best, J. R. Brabazon, Delavan.....	1 00
Best plair Sultan fowls, J. R. Brabazon, Delavan	2 50

DEPARTMENT F — AGRICULTURE.

CLASS 26—*Field Products.*

Best sample spring wheat (Rio Grande or China Tea), 4 entries, D. T. Pilgrim, West Granville.....	5 00
Second best, George Jeffrey Milwaukee.....	3 00
Best sample spring wheat, (Fife) 4 entries, Geo. Jeffrey, Milwaukee.	5 00
Second best, D. T. Pilgrim, West Granville.....	3 00
Best any other variety spring wheat, 9 entries, D. T. Pilgrim, West Granville	5 00
Second best, Geo. Jeffrey, Milwaukee.....	3 00
Best sample blue stem spring wheat, 1 entry, C. E. Angell, Oshkosh	5 00
Best white winter wheat, 5 entries, D. T. Pilgrim, West Granville..	5 00
Second best, C. E. Angell, Oshkosh.....	3 00
Best red winter wheat, 10 entries, H. J. Hill, Madison.....	5 00
Second best, Chas. Hirschinger, Baraboo	3 00
Best rye, 4 entries, D. T. Pilgrim, West Granville.....	5 00
Second best, S. H. Hall, Madison.....	3 00
Best oats, 15 entries, Warren Jacket, Riley	5 00
Second best, Geo. Jeffrey, Milwaukee	3 00
Best white Schonen, oats, 4 entries, E. W. Palmer, Madison.....	5 00
Second best, D. T. Pilgrim, West Granville....	3 00
Best barley, 9 entries D. T. Pilgrim, West Granville.....	5 00
Second best, Robert Caldwell, Arlington.....	3 00
Best buckwheat, 8 entries, C. E. Angell, Oshkosh.....	4 00
Second best, D. T. Pilgrim, West Granville..... ..	2 00
Best flax seed, 8 entries, D. T. Pilgrim, West Granville.....	5 00
Second best, C. E. Angell, Oshkosh.....	3 00

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Bale of hops	No entries
Best timothy seed, 8 entries, Geo. Jeffrey, Milwaukee	$5 00
Second best, D. T. Pilgrim, West Granville	3 00
Best clover seed, 6 entries, D. T. Pilgrim, West Granville	5 00
Second best, C. E. Angell, Oshkosh	3 00
Best variety of red top, 2 entries, C. E. Angell, Oshkosh	3 00
Best Hungarian millet, 4 entries, Geo. Jeffrey, Milwaukee	3 00
Best of any other variety, 1 entry, C. E. Angell, Oshkosh	3 00
Best field peas, 3 entries, C. E Angell, Oshkosh	5 00
Best yellow field peas, 1 entry, C. E. Angell, Oshkosh	3 00
Best peas of any other variety, 5 entries, C. E. Angell, Oshkosh	3 00
Second best, R. B. Clark, Beloit	2 00
Best Navy beans, 14 entries, Geo. Jeffrey, Milwaukee	5 00
Second best, Geo. W. McDougal, Madison	3 00
Best beans of any other variety, 14 entries, E. D. Lewis, Lake Mills	5 00
Second best, S. H. Hall, Madison	3 00
Best White Dent corn, 18 entries Henry Bowers, Milton	5 00
Second best, Burrington Bros., Sun Prairie	3 00
Best Yellow Dent corn, 32 entries, Arther O. Babbitt, Beloit	5 00
Second best, Cook Bros., Brooklyn	3 00
Best White Flint corn, 5 entries, C. E. Angell, Oshkosh	5 00
Second best, M. W. Hopson Ft. Atkinson	3 00
Best Yellow Flint corn, 20 entries, R. B. Clark, Beloit	5 00
Second best, J. B. Stone, Oregon	3 00
Best bale Broom corn, 3 entries, S. Dunlap, Token Creek	5 00
Second best, C. E. Angell, Oshkosh	3 00
Best 10 pounds of tobacco (not Connecticut seed leaf), 2 entries, P. W. Brown, Madison	5 00
Second best, A. S. Bailey, Sun Prairie	3 00
Best quality and display of Wisconsin tobacco, 6 entries, Chas. Mead, Sun Prairie	5 00
Second best, Lansing E. Hildreth, Stoughton	3 00
Best 6 pumpkins, 9 entries, E. C. Holt, Madison	3 00
Second best, Geo. J. Brown, Madison	2 00
Best exhibition of field products grown in the state, including not less than 12 varieties in all, each sample to be free to compete for the foregoing individual prizes, both quality and number to be considered, and being not less in quantity than as above specified, 5 entries, D. T. Pilgrim, West Grenville	20 00
Second best, C. E. Angell, Oshkosh	10 00

CLASS 27 — *Garden and Vegetable Produce.*

Best Early Rose or Ohio potatoes, 19 entries, Chas. Mead, Sun Prairie	3 00
Second best, Abraham Jacket, Riley	2 00
Best Beauty of Hebron potatoes, 15 entries, Annie W. Cooper, Madison	3 00
Second best, Chas. Mead, Sun Prairie	2 00
Best any other variety of Early potatoes, 18 entries, E. W. Palmer, Madison	3 00
Second best, J. M. Smith, Green Bay	2 00
Best Snowflake potatoes, 18 entries, Annie W. Cooper, Madison	3 00
Second best, Chas. Mead, Sun Prairie	2 00
Best any other variety of late potatoes, 16 entries, J. M. Smith, Green Bay	3 00
Second best, E. W. Palmer, Madison	2 00
Best and largest variety of potatoes, 7 entries, H. C. Wilson, Madison	5 00

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Best Yellow Nansemond sweet potatoes, 1 entry, J. M. Smith, Green Bay $3 00
Best Red Bermuda sweet potatoes ..... No entries
Best 4 quarts Lima beans, shelled, 9 entries, E. R. Bement, Oregon. 3 00
Second best, G. Steng, Madison 2 00
Best Turnip beets, 20 entries, Fred Schmidt, Madison 3 00
Second best, H. J. Hill, Madison 2 00
Best Long Blood beets, 9 entries, I. S. Newton, Verona 3 00
Second best, E. R. Bement, Oregon 2 00
Best Mangel Wurzel, 12 entries, J. W. Wood, Baraboo 3 00
Second best, H. A. Tenney, Madison 2 00
Best Red Wethersfield onions, 15 entries, E. C. Holt, Madison 3 00
Second best, H. Taylor, Madison 2 00
Best Yellow Danvers onions, 13 entries, H. A. Tenney, Madison ... 3 00
Second best, G. Stang, Madison 2 00
Best white variety of onions, 12 entries, H. A. Tenney, Madison ... 3 00
Second best, M. W. Hopson, Ft. Atkinson 2 00
Best drumhead cabbage, 14 entries, J. M. Smith, Green Bay 3 00
Second best, W. H. Cook, West Point 2 00
Best 3 cabbages, of any other variety, 22 entries, H. Taylor, Madison 3 00
Second best, Abraham Jacket, Riley 2 00
Best long orange carrots, 10 entries, J. M. Smith, Green Bay 3 00
Second best, Geo. W. Ringrose, Wauwatosa 2 00
Best horn carrots, 9 entries, J. M. Smith, Green Bay 3 00
Second best, J. W. Wood, Baraboo 2 00
Best head of cauliflower, 6 entries, Geo. W. Ringrose, Wauwatosa, 3 00
Second best, G. Stang, Madison 2 00
Best 10 heads of celery, 10 entries, Henry Schuster, Middleton 3 00
Second best, J. M. Smith, Green Bay 2 00
Best 12 ears of early sweet corn, 17 entries, H. C. Wilson, Madison. 3 00
Second best, S. H. Hall, Madison 2 00
Best 12 ears of late sweet corn, 18 entries, Philip Schmidt, Madison. 3 00
Second best, E. W. Palmer, Madison 2 00
Best sample of egg plant, 3 entries, Wm. Storm, Madison 2 00
Second best, G. Stang, Madison 1 00
Best 6 watermelons, 5 entries, Abraham Jacket, Riley 3 00
Second best, Chas. Nelson, Sun Prairie 2 00
Best 6 Nutmeg melons, 6 entries, Geo. W. Ringrose, Wauwatosa .. 3 00
Second best, M. W. Hopson, Fort Atkinson 2 00
Best parsnips, 11 entries, Heath Bros., Madison 3 00
Second best, Geo. Stang, Madison 2 00
Best 12 large red peppers, 15 entries, H. A. Tenney, Madison 2 00
Second best, Mrs. J. R. Hiestand, Madison 1 00
Best 12 large yellow peppers, 6 entries, H. Taylor, Madison 2 00
Best peck of vegetable oysters, 6 entries, G. Stang, Madison 2 00
Second best, H. A. Tenney, Madison 1 00
Best 6 Hubbard squash, 22 entries, C. I. Baldwin, Brooklyn 3 00
Second best, Wm. Palmer, Oregon 2 00
Largest squash of any variety, 22 entries, J. W. Wood, Baraboo .. 3 00
Second best, J. M. Smith, Green Bay 2 00
Best 12 tomatoes, 31 entries, E. R. Bement, Oregon 3 00
Second best, H. A. Tenney, Madison 2 00
Best flat turnips, 6 entries, Thos. G. Good, Madison 3 00
Second best, Wm. Palmer, Oregon, Wis 2 00
Best rutabagas, 10 entries, G. Stang, Madison 3 00
Second best, S. H. Hall, Madison 2 00
Best exhibition by professionals, including not less than five specimens of vegetables, nor less than 12 varieties in all, both quality and number of varieties to be considered, 5 entries, M. W. Hopson, Fort Atkinson ..... S. P. 10 00
Second best, J. M. Smith, Green Bay ..... S. P. 5 00

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Best exhibition by non-professionals, including not less than 5 specimens of vegetables, nor less than 12 varieties in all, both quality and number of varieties to be considered, 4 entries, Abram Jacket, Riley, Wis. ..... S. P. $10 00
Second best, Warren Jacket, Riley, Wis. ..... S. P. 5 00

CLASS 28 — *Products of the Flouring Mill, Dairy and Apiary.*

Best barrel Winter Wheat flour ..... No entry
Best barrel Spring Wheat flour ..... No entry
Factory Cheese—7 entries, premium pro rated between exhibits from factories "E.", "N." and "F.", belonging to H. Z. Fish, Rich-land Centre, Wis., and M. N. Seward, Harvey, Wis.
Farm Dairy Cheese—1 entry ..... No award
Schweizer and Limburger Kaes ..... No entries
Sweepstakes ..... No entries
Creamery Butter, five entries, premium pro rated between Geo. F. Davis & Co., Dyer, Ind $10 00
Wm. Everson, Lake Mills 10 00
Best dairy butter, roll, print or package, not less than 20 pounds, 10 entries, Geo. Hickcox, Wyoming $10 00
Second best, Henry A. Philips, Sun Prairie 5 00
Dairy butter sweepstakes, 4 entries, Mrs. R. J. Atwood, Madison ... 6 25

Honey, Sugar and Syrup.

Best sample of 10 lbs. of honey in the best marketable shape, 4 entries, L. F. Biglow, Brooklyn ..... S. P. 5 00
Best practical bee-hive, 2 entries, David H. Wright, Madison. S. P. 5 00
Second best, D. D. Daniher, Madison ..... S. P. 2 00
Best honey extractor, 2 entries, David H. Wright, Madison .. S. P. 2 00
Second best, D. D. Daniher, Madison ..... S. P. 1 00
Best extracted honey, 5 entries, L. F. Biglow, Brooklyn ..... S. P. 3 00
Second best, David H. Wright, Madison ..... S. P. 1 00
Best method of handling bees, to be demonstrated on the grounds, 2 entries, D. D. Daniher, Madison ..... S. P. 10 00
Best Italian bees, 2 entries, David H. Wright, Madison ..... S. P. 5 00
Second best, D. D. Daniher, Madison ..... S. P. 3 00
Best wax extractor ..... No entries.
Best and largest display apiarian supplies and fixtures, 2 entries, D. D. Daniher, Madison ..... S. P. $5 00
Second best, David H. Wright, Madison ..... S. P. 3 00
10 pounds maple sugar ..... No entry.
Best gallon Maple Syrup, 1 entry, J. P. Woodward, Mendota .. S. P. 5 00
Amber Cane Syrup and Sugar ..... No entries.

CLASS 29.—*Household Products—Bread and Cake.*

Best loaf of graham bread, 8 entries, Miss Nellie C. Chase, Madison $3 00
Best loaf of white bread (hop yeast), 8 entries, I. S. Newton, Verona 3 00
Best loaf of Indian bread, 8 entries, Miss Nellie C Chase, Madison 3 00
Best sponge cake, 8 entries, Mrs. J. R. Hiestand, Madison 2 00
Best pound cake, 5 entries, Mrs. J. R. Hiestand, Madison 2 00

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Best jelly cake, 9 entries, Miss Jessie Gilbert, Madison..... $2 00
Best chocolate cake, 7 entries, Mrs. E. R. Shepard, Madison..... 2 00
Best cocoanut cake, 3 entries, Miss Elsie Baker, Madison..... 2 00
Best fruit cake, 4 entries, Miss Elsie Baker, Madison..... 2 00
Best and largest exhibition of articles of above sorts, 2 entries, Mrs. J. R. Hiestand, Madison.....Silver Medal.

Sealed and Preserved Fruits and Pickles.

Best canned peaches, 3 entries, S. L. Mead, Sun Prairie..... 2 00
Best canned plums, 6 entries, R. E Tipple, Madison..... 2 00
Best canned currants, 5 entries, S. L. Mead, Sun Prairie..... 2 00
Best canned tomatoes, 8 entries, W. R. Bailey, Sun Prairie..... 2 00
Best canned gooseberries, 2 entries S. L. Mead, Sun Prairie..... 2 00
Best canned raspberries, 13 entries, Miss Nellie C. Chase, Madison. 2 00
Best canned strawberries, 5 entries, S. L. Mead, Sun Prairie..... 2 00
Best canned grapes, 6 entries, N. R. Bailey, Sun Prairie..... 2 00
Best canned blackberries, 8 entries, Miss Nellie C. Chase, Madison 2 00
Best canned pears, 3 entries.....No award.
Best canned Hyslop or Transcendent crabs, 9 entries, Mrs. R. J. Atwood, Madison..... 2 00
Best plum jelly, 7 entries, Mrs. N B Carr, Madison..... 2 00
Best currant jelly 5 entries, S. L. Mead, Sun Prairie..... 2 00
Best red raspberry jelly, 6 entries, Mrs. R. E. Tipple, Madison..... 2 00
Best crab apple jelly, eight entries, Miss Emelia Steinle, Madison.. 2 00
Best marmalade, 7 entries, R. E. Tipple, Madison..... 2 00
Best raspberry jam, 8 entries, Mrs. N. B. Carr, Madison..... 2 00
Best blackberry jam, 7 entries, I. S. Newton, Verona..... 2 00
Best pickled cucumbers, 5 entries, Mrs. R. J. Atwood, Madison ... 2 00
Mangoes..... No entries.
Best pickled red cabbage, 5 entries, Miss Annie W. Cooper, Madison..... 2 00
Best pickled caul flower, 5 entries, S. L. Mead, Sun Prairie..... 2 00
Best pickled onions, 4 entries, Miss Georgia Hough, Madison..... 2 00
Best mixed pickles, 6 entries, Miss Emelia Steinle, Madison..... 2 00
Best sweet pickled peaches, 2 entries, S. L. Mead, Sun Prairie..... 2 00
Best sweet pickled apples, 4 entries, Miss Annie W. Cooper, Madison..... 2 00
Best apple butter, 4 entries, Miss Emelia Steinle, Madison..... 2 00
Best tomatoe catsup, 7 entries, R. E. Tipple, Madison..... 2 00
Best and largest exhibition of fruits, jellies, jams and pickles in glass jars, 6 entries, S. L. Mead, Sun Prairie.....S. P. 5 00

Miscellaneous Articles — Not on List.

Comb foundation, D. D. Daniher, Madison, commended.
Perfect gem squash, Geo. J. Brown, Madison, commended.
Cocoanut squash, Geo. J. Brown, Madison, commended.
Greek cucumber, Geo. J. Brown, Madison, commended.
Marblehead squash, H. Taylor, Madison, commended.

DEPARTMENT G.— FRUITS AND FLOWERS.

CLASS 30.—*Fruit by Professional Cultivators.*

Apples, greatest display of varieties, 7 entries, A. G. Tuttle, Baraboo..... $10 00
Second, Chas. Hirschinger, Baraboo..... 7 50
Third, G. P. Peffer, Pewaukee..... 3 00

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Apples, best ten varieties adapted to northwest, 7 entries, Chas. Hirschinger, Baraboo	$7 00
Second, A. G. Tuttle, Baraboo	5 00
Third, G. P. Peffer, Pewaukee	2 00
Apples, best 5 varieties adapted to northwest, 7 entries, G. P. Peffer, Pewaukee	3 00
Second, Chas. Hirschinger, Baraboo	2 00
Third, E. Wilcox & Son, La Crosse	1 00
Best variety of Winter apples, 7 entries, A. G. Tuttle, Baraboo	5 00
Second, E. Wilcox & Son, La Crosse	3 00
Third, Chas. Hirschinger, Baraboo	1 00
Best 5 varieties of Winter apples, 7 entries, A. G. Tuttle, Baraboo	3 00
Second, Chas. Hirschinger, Baraboo	2 00
Third, E. Wilcox & Son, La Crosse	1 00
Best show of 10 varieties of large and showy apples, 7 entries, A. G. Tuttle, Baraboo	5 00
Second, Chas. Hirschinger, Baraboo	3 00
Third, G. P. Peffer, Pewaukee	1 00
Best plate of Duchess of Oldenburg, 7 entries, G. P. Peffer, Pewaukee	1 00
Best plate of Famuse, 7 entries, E. Wilcox & Son, La Crosse	1 00
Best plate of Golden Russet, 7 entries, A. G. Tuttle, Baraboo	1 00
Best plate of Pewaukee, 7 entries, G. P. Peffer, Pewaukee	1 00
Best plate of St. Lawrence, 7 entries, G. P. Peffer, Pewaukee	1 00
Best plate of Tallman Sweet, 7 entries, Chas. Hirschinger, Baraboo,	1 00
Best plate of Utter, 7 entries, A. G. Tuttle, Baraboo	1 00
Best plate of Alexander, 7 entries, A. G. Tuttle, Baraboo	1 00
Best plate of Plumb Cider, 7 entries, A. G. Tuttle, Baraboo	1 00
Best plate of Wealthy, 7 entries, G. P. Peffer, Pewaukee	1 00
Best display of variety of pears, 3 entries, G. P. Peffer, Pewaukee,	5 00
Second, Wm Reed, North Prairie	2 00
Third, A. G. Tuttle, Baraboo	1 00
Best 3 varieties of pears, 2 entries, G. P. Peffer, Pewaukee	2 00
Second, Wm. Reed, North Prairie	1 00
Best Flemish Beauty, 4 entries, E. Wilcox & Son, La Crosse	2 00
Second, A. G. Tuttle, Baraboo	1 00
Best plate Beurre d' Anjou, 2 entries, Wm. Reed, North Prairie	1 00
Best plate Clapp's Favorite, 2 entries, Wm. Reed, North Prairie	1 00
Best variety of Plums, 3 entries, G. P. Peffer, Pewaukee	3 00
Second, Geo. J. Kellogg, Janesville	2 00
Third, Wm. Reed, North Prairie	1 00
Best three varieties of Plums, 2 entries, G. P. Peffer, Pewaukee	2 00
Second, Geo. J. Kellogg, Janesville	1 00
Best collection of Native Plums, 2 entries, G. P. Peffer, Pewaukee.	2 00
Best plate of Native Plums, 4 entries, Chas. Hirschinger, Baraboo.	1 00

CLASS 31—*Grapes and Crabs by Professional Cultivators.*

Best display of varieties of grapes, 3 entries, Wm. Reed, North Prairie	10 00
Second best, G. P. Peffer, Pewaukee	7 00
Third best, A. G. Tuttle, Baraboo	3 00
Best 10 varieties of grapes, 3 entries, Wm. Reed, North Prairie	5 00
Second best, G. P. Peffer, Pewaukee	3 00
Third best, A. G. Tuttle, Baraboo	1 00
Best 5 varieties of grapes, 4 entries, Wm. Reed, North Prairie	3 00
Second best, A. G. Tuttle, Baraboo	2 00
Third best, G. P. Peffer, Pewaukee	1 00
Best single variety of grapes, 4 entries, G. P. Peffer, Pewaukee	2 00
Second best, A. G. Tuttle, Baraboo	1 00
Best three bunches of Concord on 1 cane, three entries, Wm. Reed, North Prairie	2 00
Second best, G. P. Peffer, Pewaukee	1 00

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Best 3 bunches of Delaware on 1 cane, 2 entries, Wm. Reed, North Prairie $2 00
Second best, G. P. Peffer. Pewaukee 1 00
Best three bunches of Worden on 1 cane, 3 entries, Wm. Reed, North Prairie 2 00
Second best, A. G. Tuttle, Baraboo 1 00
Best 3 bunches of Wilder on 1 cane, 3 entries, Wm. Reed, North Prairie 2 00
Best single variety of grapes, 3 entries, Wm. Reed, North Prairie 3 00
Second best, G. P. Peffer, Pewaukee 2 00
Crabs—greatest variety named, 7 entries, E. Wilcox & Son, La Crosse 3 00
Second best, G. P. Peffer, Pewaukee 2 00
Third best, Chas. Hirschinger, Baraboo 1 00
Best plate of Hyslop crabs, 7 entries, Chas. Hirschinger, Baraboo 1 00
Best plate of Transcendent crabs, 6 entries, A. G. Tuttle, Baraboo 1 00
Best Whitney, No. 20, 7 entries, A. G. Tuttle, Baraboo 1 00
Best seedling crab, 6 entries, H. G. Tuttle, Baraboo 2 00

Sweepstakes.

Best collection fruit of all kinds, 5 entries, A G. Tuttle, Baraboo.. 7 00
Second, G. P. Peffer, Pewaukee 5 00
Third, Wm. Reed, North Prairie 2 00
Best bushel of cranberries, 1 entry ..... No award

CLASS 32.—*Fruits by Non-Professional Cultivators.*

APPLES.

Best display of varieties, 7 entries, Geo. Townsend, Baraboo $10 00
Second best, E. W. Palmer, Madison 7 00
Third best, Geo. Jeffrey, Milwaukee, Wis. 3 00
Best 10 varieties adapted to northwest, 9 entries, Geo. Jeffrey, Milwaukee 7 00
Second best, D. T. Pilgrim, West Granville 5 00
Third best, Geo. Townsend, Baraboo 2 00
Best 5 varieties adapted to northwest, 7 entries, E. D. Lewis, Lake Mills 3 00
Second best, Geo. Jeffrey, Milwaukee 2 00
Third best, D. T. Pilgrim, West Granville 1 00
Best 10 varieties large and showy apples, 6 entries, Geo. Townsend, Baraboo 5 00
Second best, Geo. Jeffrey, Milwaukee 3 00
Third best, E. W. Palmer, Madison 1 00
Best variety of winter, 6 entries, Geo. Townsend, Baraboo 5 00
Second best, Geo. Jeffrey, Milwaukee 3 00
Third best, D. T. Pilgrim, West Granville 1 00
Best 5 varieties of winter, 6 entries, E. D. Lewis, Lake Mills 3 00
Second best, H. C. Wilson, Madison 2 00
Third best, Geo. Jeffrey, Milwaukee 1 00
Best plate of Duchess of Oldenburg, 11 entries, H. C. Wilson, Madison 1 00
Best plate of Famuse, 10 entries, Geo. Jeffrey, Milwaukee $1 00
Best plate of Golden Russet, 10 entries, D. S. Wilson, Madison 1 00
Best plate of Pewaukee, 6 entries, Geo. Townsend, Baraboo 1 00
Best plate of St. Lawrence, 7 entries, E. W. Palmer, Madison 1 00
Best plate of Tallman Sweet, 11 entries, Geo. Townsend, Baraboo. 1 00
Best plate of Utter, 6 entries, P. W. Brown, Madison 1 00
Best plate of Alexander, 7 entries, A. Viall, Madison 1 00
Best plate of Plumb Cider, 7 entries, P. W. Brown, Madison 1 00
Best plate of Wealthy, 4 entries, Geo Jeffrey, Milwaukee 1 00

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PEARS.

Best display of varieties of pears, 2 entries, Geo. Jeffrey, Milwaukee	$5 00
Second, D. T. Pilgrim, West Granville	3 00
Best three varieties of pears, 2 entries, Geo. Jeffrey, Milwaukee	2 00
Second, D. T. Pilgrim, West Granville	1 00
Best Flem sh Beauty, 5 entries, Geo Jeffrey, Milwaukee	2 00
Second D T. Pilgrim, West Granville	1 00
Best plate of Beurre d'Anjou, 2 entries, Geo. Jeffrey, Milwaukee	1 00
Best plate of Clapp's Favorite, 1 entry, Geo. Jeffrey, Milwaukee	1 00
Best variety of plums, 1 entry, Geo. Jeffrey, Milwaukee	3 00
Best 3 varieties of plums, 1 entry, Geo. Jeffrey, Milwaukee	2 00
Best collection of native plums, 3 entries. H. C. Wilson, Madison	2 00
Best plate of native plums, 4 entries, Henry Schuster, Mcdison	1 00

CLASS 33—*Grapes and Crabs, by Non-Professional Cultivators.*

Best display of varieties of grapes, 5 entries, Henry Schuster, Middleton	10 00
Second best, E. D. Lewis, Lake Mills	7 00
Third best, Geo. Jeffrey, Milwaukee	3 00
Best ten varieties of grapes, 5 entries, E. D. Lewis, Lake Mills	5 00
Second best, Wm. Fox, Baraboo	3 00
Third best, Henry Schuster, Middleton	1 00
Best 5 varieties of grapes, 3 entries, E. D. Lewis, Lake Mills	3 00
Second best, Wm. Fox, Baraboo	2 00
Third best, Henry Schuster, Middleton	1 00
Best single variety of grapes, 10 entries, E. D. Lewis, Lake Mills	2 00
Second best, D. S. Wilson, Madison	1 00
Best 3 bunches of Concord on 1 cane, 7 entries, Elias Long, Madison	2 00
Second best, E. D. Lewis, Lake Mills	1 00
Best 3 bunches of Delaware on 1 cane, 5 entries, E. D. Lewis, Lake Mills	2 00
Second best, Geo. Jeffrey, Milwaukee	1 00
Best 3 bunches of Worden on 1 cane, 4 entries, E. D. Lewis, Lake Mills	2 00
Second best, Geo. Jeffrey, Milwaukee	1 00
Best 3 bunches of Wilder on 1 cane, 2 entries, Wm. Fox, Baraboo,	2 00
Best single variety of grapes, 4 entries, E. D. Lewis, Lake Mills	3 00
Second best, Geo. Jeffrey, Milwaukee	2 00

CRABS.

Greatest variety named, 8 entries, Henry Schuster, Middleton	3 00
Second best, Geo. W. Ringrose, Wauwatosa	2 00
Third best, D. T. Pilgrim, West Granville	1 00
Best plate of Hyslop, 13 entries, E. D. Lewis, Lake Mills	1 00
Best plate of Transcendents, 6 entries, Henry Schuster, Middleton,	1 00
Best plate of Whitney, No. 20, 6 entries, P. W. Brown, Madison	1 00
Best seedling crab, 2 entries; judges reported exhibit unworthy of notice.	
Best collection of fruit of all kinds, 3 entries, Geo. Jeffrey, Milwaukee	7 00
Second, Henry Schuster, Middleton	5 00
Third, E. D. Lewis, Lake Mills	1 00

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CLASS 34 — *Seedling Apple — 1 entry.*

Chas. Hirschinger, Baraboo; judges report exhibit very good, to be shown for three successive years.

CLASS 35 — *Nursery Trees — 2 Entries, No Awards.*

CLASS 36 — *Flowers by Professional Cultivators.*

Best and most artistically arranged floral design, 3 entries, Geo. W. Ringrose, Wauwatosa	$5 00
Second best, C. H. Avery, Madison	3 00
Best and most tastefully arranged basket of flowers, 3 entries, Geo. W. Ringrose, Wauwatosa	3 00
Best and most tastefully arranged collection of cut flowers, 4 entries, C. H. Avery, Madison	4 00
Second best, Geo. W. Ringrose, Wauwatosa	3 00
Best pyramidal bouquet, 3 entries, C. H. Avery, Madison	3 00
Second best, Geo. W. Ringrose, Wauwatosa	2 00
Best pair of flat table bouquets, 3 entries, C. H. Avery, Madison	2 00
Second best, Geo. W. Ringrose, Wauwatosa	1 00
Best bouquet of everlasting flowers, 2 entries, J. H. Bisskumer, Freeport, Ill	3 00
Best 10 named dahlias, 3 entries, Chas Hirschinger, Baraboo	2 00
Best display of roses, 2 entries, C. H. Avery, Madison	3 00
Best 5 named varieties of roses, 2 entries, C. H. Avery, Madison	3 00
Best display of verbenas, 2 entries, C. H. Avery, Madison	2 00
Best show of pansies, 3 entries, Wm. Toole, North Freedom	1 00
Best show of double petunias, 1 entry, C. H. Avery, Madison	1 00
Best show of gladiolas, 2 entries, Chas. Hirschinger, Baraboo	2 00
Best show of lilies, 1 entry	No award.
Best show of tube roses, 2 entries, Geo. W. Ringrose, Wauwatosa	1 00
Best show of green house plants (not less than 50 nor more than 100 varieties), 2 entries, Geo. W. Ringrose, Wauwatosa	7 00
Second best, C. H. Avery, Madison	5 00
Best 20 varieties of green house plants in bloom, 2 entries, C. H. Avery, Madison	3 00
Second, Geo. W. Ringrose, Wauwatosa	2 00
Best ten geraniums, 2 entries, Geo. W. Ringrose, Wauwatosa	3 00
Best 6 fuchsias, 2 entries, Geo. W. Ringrose, Wauwatosa	2 00
Best display of flowers of all kinds, grown by exhibitor, 3 entries, C. H. Avery, Madison	5 00
Best display of ornamental foliage plants, 2 entries, Geo. W. Ringrose, Wauwatosa	3 00

CLASS 37 — *Flowers by Non-Professional Cultivators.*

Best and most artistically arranged floral design, 4 entries, Mrs. J. R. Hiestand, Madison	5 00
Second, P. W. Brown, Madison	3 00
Best collection of cut flowers, 5 entries, Mrs. Geo. Memhard, Madison	4 00
Second, P. W. Brown, Madison	3 00
Best and most tastefully arranged basket of flowers, 6 entries, Mrs. J. R. Hiestand, Madison	3 00

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Best pyramidal bouquet, 4 entries, Mrs. J. R. Hiestand, Madison.. $3 00
Second, P. W. Brown, Madison 2 00
Best pair of round boquets, 4 entries, Mrs. Geo. Memhard, Madison 2 00
Best pair of flat table boquets, 3 entries, Mrs. J. R. Hiestand, Madison 2 00
Best boquet of everlasting flowers, 1 entry, Mrs. J. W. Wood, Baraboo 2 00
Best display of dahlias, not more than 20 varieties, Miss Nellie Peffer, Pewaukee..... 2 00
Best ten named dahlias, 2 entries, Miss Nellie Peffer, Pewaukee... 2 00
Best display of roses, 4 entries, Mrs. Geo. Memhard, Madison 3 00
Best five named varieties of roses, 2 entries, Miss Edith A. Kellogg, Janesville..... 3 00
Best display of verbenas, 6 entries, Mrs. Geo. Memhard, Madison. 2 00
Best ten named Verbenas.....No entries
Best show of asters in quality and variety, 2 entries, Miss Kate Brown, Madison..... 2 00
Best show of perennial phlox, 3 entries, Mrs. Geo. Memhard, Madison..... 1 00
Best show of pansies, 3 entries, P. W. Brown, Madison..... ... 1 00
Best show of double Petunias, 3 entries, Mrs. D. F. Saulisbury, Oregon 1 00
Best show of dianthuses (pink), 1 entry, Mrs. J. R. Hiestand, Madison..... 1 00
Best show of gladiolas, 2 entries, Mrs. Geo. Memhard, Madison... 2 00
Best show of phlox drummondi, 1 entry, Miss Kate Brown, Madison..... 1 00
Best show of tube roses, 1 entry, Ella McDougal, Madison..... 1 00
Best show of lilies.....No entries
Best show of stocks and balsams.....No entries
Best show of green house plants not less than 25 nor more than 50 varieties, 1 entry, Mrs. Geo. Memhard, Madison..... 5 00
Best 10 varieties of green house plants in bloom, 1 entry, Mrs. Geo. Memhard, Madison..... 3 00
Best 10 geraniums, 1 entry, Mrs. Geo. Memhard, Madison..... 3 00
Best 6 fuchsias, 1 entry, Mrs. Geo. Memhard, Madison 2 00
Best carnations and ornamental grasses.....No entries
Best display of flowers raised by exhibitor, 5 entries, Miss Edith A. Kellogg, Janesville..... 5 00
Second best, Miss Nellie Peffer, Pewaukee..... 3 00
Best show of ornamental foliage plants, not more than 10 varieties, 1 entry, Mrs. Geo. Memhard, Madison.. ..... 3 00

DEPARTMENT I — MANUFACTURES.

CLASS 39 — *Stone Cutters' Work and other Building Material.*

Only one entry in entire class. No award.

CLASS 40 — *Metallurgic Products.*

No entries.

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CLASS 41 — *Stoves, Furnaces, Hollow Ware, etc.*

Cooking stove for coal, 3 entries.....No award
Cooking stove for wood.....No entry
Best cooking range for families, 2 entries, J. Sumner & Morris, Madison $5 00
Best ornamental parlor stove, 5 entries, Scheibel & Krehl, Madison, 5 00
Best display of stoves, Giles Bros.....Gr. sil. med.
Best display of oil stoves .....No entries
Brass and copper wire, hollow ware, fire grates, lightning apparatus and steel hammers .....No entries
Best horse shoes in variety, 2 entries, T. Brady, Madison..... 2 00
Best display of shelf hardware, 1 entry, J. Sumner & Morris, Madison .....Grand Silver Medal.
Best display of counter scales, 1 entry, Chicago Scale Co., Chicago, Illinois .....Diploma.
Plumbers' work, guns, refrigerators, safes and ornamental iron work.....No entries.

CLASS 42 — *Silver, Brittania and Crockery Ware.*

Brittania and crockery ware.....No entry.
Best display gold and silver electro-plating, 1 entry, G. B. Kelley, Rockford, Ill.....Diploma.
Best collection of glass, china and earthenware, 1 entry, W. J. and F. Ellsworth, Madison.....Diploma.

CLASS 43—*Surgical, Dental, Mathematical and Philosophical Instruments and Apparatus.*

No entries in entire class, except one in mathematical instruments, J. Glueck, Madison.....Diploma.

CLASS 44.— *Chemical Manufacture.*

Carbonate of lead, oxide of zinc, mineral paint, dyes, blacking, bar soap.....No entries.
Best fancy soap, 1 entry, C. H. Avery, Madison .....Diploma.
Potash, bicarbonate potash, candles, Lucifer matches .....No entries.
Best show of perfumery, two entries, A. H. Hollister, Madison..Sil. Medal.
C. H. Avery, Madison .....Diploma.
Fancy soaps and perfumery.....No entries.

CLASS 45 — *Carriages, Wagon Work, etc.*

Best double carriage, 4 entries, Aug. Schmidt & Co., Madison..S. P. $10 00
Best double top carriage, 1 entry.
Best single top buggy, 12 entries, A. S. Brown & Co., Madison..S. P. 10 00
Best open buggy, 8 entries, J. B. Wiser, Madison.....S. P. 10 00
Trotting skeleton and road wagon .....No entries.

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Best phaeton, 6 entries, A. S. Brown & Co., Madison .....S. P. $10 00
Best double sleigh, 2 entries.
Best single sleigh, 7 entries, Aug. Schmidt & Co., Madison....S. P. 5 00
Best common farm wagon 8 entries, F. W. Stratman & Co. Dodgeville.....S. P. 5 00
Best fancy lumber wagon, 1 entry, Heitkamp & Geiger, Madison, S. P. 5 00
Best 3-spring and 3-seated wagon, 4 entries, Wisconsin Wagon Co., Madison.....S. P. 5 00
Best display of hubs, spokes, felloes and other wagon work, 1 entry, Metal Felloe Co., Chicago, Ill.....S. P. 5 00
Best display of trotting sulkies.....No entries

CLASS 46 — *Cabinetware, Cooperage, Willow Ware, etc.*

Parlor set, chamber set, bureau, extension table, center table, book case.....No entries
Best lady's work stand, 1 entry, A. G. Hughes, Madison .....S. P. 5 00
Writing table or desk, spring bed bottom, six dining chairs, display toy furniture, specimen flour barrel, barrels for liquids and meat, tubs, pails, butter firkins, display of cooperage and willoware, splint basket, willow basket, display of willow ware, dozen brooms, six ax handles.....No entries

CLASS 47.—*Leather and Leather Manufacture—Sole Leather, Upper Leather, Harness Leather, Kip Skins, Calf Skins, Colored Leather, Carriage Mats, Display of Leather.*

No entries.
Best carriage harness, 1 entry, Chas. Hoebel, Madison.....S. P. 10 00
Wagon harness .....No entry.
Best single harness, 1 entry, Chas. Hoebel, Madison.....S. P. 5 00
Saddles, trunks, collars, boots and shoes.....No entries.

CLASS 48.—*Paper, Printing, and Bookbinding—Print Paper and Printing.*

No entries.
Best exhibition of plain and fancy binding, 1 entry, G. Grimm, Madison.....Diploma.

CLASS 49.—*Textile Fabrics.*

Best fleece of wool, American merino, 1 entry, C. E. Angell, Oshkosh.....$5 and Dip.
Best fleece of long wool, 1 entry, C. E. Angell, Oshkosh.....$5 and Dip.
No other entries in entire class.

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Miscellaneous Articles — Not on List.

New Success, oil stove, Scheibel & Krehl, Madison.....Diploma.
Champion Cabinet Creamery, Dairy Implement Co., Bellows Falls, Vt.....Diploma.
Patent Eureka horse collar coupling, G. W. Griswold, Janesville.....Diploma.
Samples crackers, cakes, soaps, etc., Woodard & Stone, Watertown.....Diploma.
Crackers, F. H. Grube, Madison.....Diploma.
Copper evaporator for liquids, Vermont Farm Machine Co., Bellows' Falls, Vt.....Diploma
People's Cyclopedia, O. H. Applegate, Madison.....Diploma

DEPARTMENT K — FINE ARTS.

CLASS 50 — *Music, Musical Instruments and Sewing Machines — No Awards.*

CLASS 51 — *Works of Art.*

Best portrait in oil (not heretofore exhibited), 6 entries, James R. Stuart, Madison	$10 00
Second best, Jas. R. Stuart, Madison	5 00
Best group portrait in oil, 1 entry	No award.
Best original Landscape in oil, 17 entries, N. P. Jones, Madison	10 00
Second best, James R. Stuart, Madison	5 00
Best landscape in oil, 18 entries, Miss E. Stone, Madison	5 00
Second best, Mrs. E. M. Reeves, Madison	3 00
Best portrait of a horse, 2 entries, Jas. R. Stuart, Janesville	10 00
Best paintnig of a cow from life, 1 entry, Jas. R. Stuart, Madison	10 00
Best painting of sheep from life, 1 entry, Jas. R. Stuart, Madison	8 00
Best painting of hog from life. 1 entry	No award.
Best historical landscape in oil, 1 entry	No award.
Best bird painting in water colors	No entries.
Best crayon from photograph, 3 entries, Miss Esther Stone, Madison	5 00
Miss Grace Johnson, honorable mention.	
Best marine painting in oil, 4 entries, N. P. Jones, Madison	10 00
Second best, Miss Fannie L. Walker, Lodi	5 00
Best portrait in water colors, 3 entries, C. L. Burdick, Madison	5 00
Best India ink portrait, 7 entries, C. L. Burdick, Madison	10 00
Second best, C. L. Burdick, Madison	5 00
Best placque painting in oil, 17 entries, Miss E. Stone, Madison	3 00
Best Placque painting in water colors	No entries.
Best collection china painting, 1 entry, Mrs. S. B. Newcomb, Madison	5 00
Best single piece of china painting, 3 entries, Mrs. S. B. Newcomb. Madison	3 00
Best water color painting on silk	No entries.

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Best oil painting on silk or satin, 8 entries, Mrs. H. D. Goodnow, Madison 3 00
Best panel painting in oil, 7 entries. Jas. R. Stuart, Madison 3 00
Best panel painting in water colors, 1 entry.....No award.
Best flower painting in oil, 15 entries, Miss Kittie Joslyn, Chicago. 3 00
Best flower painting in water colors.....No entries.
Best pencil drawing, 1 entry, Mrs. S. B. Newcomb, Madison..... 2 00
Best crayon drawing, by exhibitor, 3 entries, A. C. Isaacs, Madison. 2 00
Miss Grace Johnson, Madison. Honorable mention.
Best collection paintings, water colors, 1 entry, E. L. Burdick, Madison 15 00
Best collection of oil paintings, not less than 15 pictures, Jas. R. Stuart, Madison..... 25 00
Second best, Miss Esther Stone, Madison 10 00
Best India ink photograph, 2 entries, A. C. Isaacs, Madison 5 00
Best water color stipple photograph, 1 entry, A. C. Isaacs, Madison. 5 00
Best specimen steel engraving, 1 entry, Miss Lizzie Taylor, Madison. 3 00
Steel engravings, wood engravings and architectural plans....Noentries.
Best collection photopraphs and other sun pictures, 4 entries, A. C. Isaacs, Madison..... 8 00
Second best, G. W. Wise, Evansville..... 5 00
No entries in remainder of Class 51.

CLASS 52 — *Needle, Shell and Wax Work.*

Best sample of plain sewing, embracing the different stitches used in household sewing and repairing, 8 entries, Joel Boley, Madison $2 00
Best fancy knitting work, 16 entries, Mrs. Frank Ritchie, Sun Prairie 2 00
Best cotton tidy, 18 entries, L. J. Patterson, McFarland..... 1 00
Best worsted tidy, 12 entries, Domestic Sewing Machine Co., Madison 1 00
Best specimen embroidered slippers, 4 entries, Miss P. Schiffler, Watertown 1 00
Best specimen of worsted embroidery (nand made), 4 entries, Miss Lizzie Taylor, Madison..... 2 00
Best specimen worsted embroidery (machine made), 2 entries, Joel Boley, Madison 2 00
Best raised worsted embroidery, 4 entries, Mrs. S. J. Askew, Madison..... 2 00
Best needle work or floss embroidery, 4 entries, Mrs. Jas. Burgess, Madison 2 00
Best silk embroidery (hand work), 10 entries, Miss Cornelia Vilas, Madison 2 00
Best silk embroidery (machine made), 3 entries, Joel Boley, Madison 2 00
Best specimen applique embroidery, 7 entries, Mrs. Jas. Burgess, Madison..... 2 00
Best exhibition applique embroidery, 2 entries, Domestic Sewing Machine Co., Madison..... 2 00
Best exhibition Cretonne embroidery, 1 entry, Mrs. Jas. Burgess, Madison..... 2 00
Best picture embroidery, 3 entries, Mrs. S. J. Askew, Madison.... 2 00
Best Kensington embroidery, 6 entries, Miss Cornelia Vilas, Madison..... 2 00
Best silk embroidered child's dress, 3 entries, Mrs. S. J. Askew, Madison..... 2 00
Best Arasene embroidery, 6 entries, Mrs. L. Dutton, Madison..... 1 00

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Best chair cover, upholstered, 1 entry, L. S. Newton, Verona..... $2 00
Best chair cover, not upholstered, 1 entry, Mrs. I. J. Askew, Madison..... 1 00
Best ottoman cover, upholstered, 3 entries, Miss Ellen Cheeney, Madison..... 2 00
Best ottoman cover, not upholstered, 6 entries, Mrs. Jas. E. Brett, Sharon..... 1 00
Best sofa cushion, upholstered, 8 entries, Miss P. Schiffler, Watertown..... 2 00
Best sofa cushion, not upholstered, 8 entries, Miss P. Schiffler, Watertown..... 1 00
Best set of embroidered underclothes, 3 entries, Joel Boley, Madison..... 2 00
Best infant's robe and skirt, 4 entries, H Craven and F. Reynolds, Madison..... 2 00
Best exhibition any kind of lace work of exhibitors, 4 entries, Mrs. Frank Ritchie, Sun Prairie..... 3 00
Best specimen darned lace, 6 entries, Mrs. Jas. E Brett, Sharon... 2 00
Macrami lace ..... No entries.
Best specimen etching on silk, satin or linen, 8 entries, Domestic Sewing Machine Co., Madison 2 00
Best specimen etching in India ink.....No entries.
Best specimen hand braid work, 1 entry.....No award.
Best specimen of machine braid work, 2 entries, White Sewing Machine Co., Madison 1 00
Best specimen of pillow shams (hand made), 6 entries, Mrs. James Burgess, Madison 1 00
Best specimen of pillow shams (machine made), 3 entries, Joel Boley, Madison..... 1 00
Best specimen table scarfs, 7 entries, Miss P. Schiffler, Watertown 2 00
Best table spread, 6 entries, Domestic Sewing Machine Co., Madison 2 00
Best wall banner, 8 entries, Miss Ellen T. O'Malley, Mendota..... 1 00
Best mantle lambrequin, 6 entries, Miss P. Schiffler, Watertown... 1 00
Best window lambrequin, 2 entries, Mrs. L Dutton, Madison..... 1 00
Best gents' dressing gown, 2 entries, Miss H. Craven and F. Reynolds, Madison..... 3 00
Best sample of work in wax, 2 entries, Mrs. E. J. Schulof, Madison 1 00
Best sample of work in feathers, 3 entries, Miss Ellen Cheney, Madison 1 00
Best shell work, 1 entry, L. S. Patterson, McFarland..... 1 00
Best leather work, 1 entry, N. R. Bailey, Sun Prairie..... 1 00
Best bead work, 3 entries, Mrs. M. M. Dorn. Madison..... 2 00
Best agricultural wreath, 1 entry, Mrs. E. J. Schulof, Madison.... 2 00
Best exhibition of hair work, 5 entries, Mrs E. Newton. Oregon.. 2 00
Best toilet set, 7 entries, Mrs. Jas. Burgess, Madison..... 2 00
Best afghan, 7 entries, Mrs. M. R. Doyon, Madison..... 2 00
Best air castle, 1 entry, Mrs. N. B. Carr, Madison..... 2 00
Best sample fancy netting, 2 entries, Miss Kate Raffel, Madison... 2 00
Bleached ferns and skeleton leaves.....No entries
Best display in entire class, 6 entries, Mrs. L. Dutton, Madison S. P. 10 00

For Boys and Girls under Fifteen Years of Age.

The only entries in this class were:
Best collection of bracket work, 1 entry, Louie Olson, Madison.... $3 00
Best single piece of bracket work, 1 entry, Louie Olson, Madison.. 1 00

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CLASS 53 — *Domestic Manufacture.*

Best Kersey blanket, 10 entries. Mrs. D. S, Wilson, Madison $4 00
Second best, Mrs. Jas. Burgess, Madison..... 2 00
Be t 10 yards of home-made flannel.....No entries.
Best 10 yar 's of home-made flannel (colored), 1 en:ry, Ed. Topelman, Madison, second premium..... 2 00
Best rug of any material, 24 entries. C. Getts, Lake View..... 4 00
Second best, Mrs. H. E. Munger, Brooklyn 2 00
Best 15 yards of rag carpet, 11 entries, Mrs. P. P. Calhoun, Baraboo 4 00
Second best, R. E. Tipple, Madison..... 2 00
Best woolen stockings, 8 entries, I. S. Newton, Verona..... 2 00
Best woolen socks, 9 entries, I. S. Newton, Verona..... 2 00
Best 2 pounds woolen yarn, 5 entries, Mrs. Youngs Hallock, Middleton 2 00
Best woolen mittens, 6 entries, N. R. Bailey, Sun Prairie..... 2 00
Best fringed woolen mittens, 2 entries, L. J. Patterson, McFarland,.....
Best white quilt, machine made, 1 entry, L. J. Patterson, McFarland..... 4 00
Best white quilt, hand made, 3 entries, N. R. Bailey, Sun Prairie.. 4 00
Second best, Mrs. D. F. Salisbury, Oregon 2 00
Best silk quilt, 8 entries, Mrs. Jas. E. Brett Sharon..... 4 00
Second best, Mrs. A. S. Brown, Madison..... 2 00
Best log cabin quilt, not silk, 8 entries, Miss Lizzie Taylor, Madison, 4 00
Second best, Mrs. E. Newton, Oregon..... 2 00
Sest silk log cabin quilt, 4 entries, Mrs. Ellen Lucas, Madison..... 4 00
Second best, Mrs. E L. Rood, Madison..... 2 00
Best patch-work quilt, 8 entries, Mrs. M. M. Dorn, Madison..... 4 00
Second best, Mrs. W. R. Bird, Verona..... 2 00
Best knit counterpane, 2 entries, Emelia T. Steinle, Madison..... 4 00
Second best, Amelia Miller, Madison 2 00
Best wrought counterpane, 4 entries, ...
Second best, Mrs. N. B. Cramton, Madison..... 2 00
Best worsted scarf, 5 entries, Mrs. S, B Newcomb, Madison..... 4 00
Best wrought shawl, 5 entries, Mrs. S. B. Newcomb, Madison 3 00
Best window or door curtain, 4 entries, Miss H. Craven & F. Reynolds, Madison..... 2 00
Best exhibition of taste and skill in cutting and making ladies dresses by other than professional manufacture, 1 entry, Miss H. Craven & F. Reynolds, Madison ..... S. P. 10 00
Best specimen gent's shirt, 4 entries, Mrs. Jas. Burgess, Madison.. 2 00
Best specimen of darning, 5 entries, N. R. Bailey, Sun Prairie..... 2 00
Best specimen of patched mending, 3 entries, Miss Mary J. Hallock, Middleton..... 2 00
Articles of Millinery .....No entries.
Best ladies cloak, domestic manufacture, 3 entries, Miss H. Craven and F. Reynolds, Madison..... 4 00
Best ladies sack, domestic manufacture, 2 entries, Miss H. Craven and F. Reynolds, Madison 3 00
Best display in this entire class, by one exhibitor, 2 entries, Miss H. Craven & F. Reynolds, Madison.....S. P. 10 00

CLASS 54—*Natural History.*

The only entries in this class were:
Best botanical display of noxious weeds of Wisconsin, three entries: equal division of premiums between Mrs. N. B. Carr, Madison, and L. H. Pammel, Madison.....each 2 50

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Best collection illustrating the botany of Wisconsin, 2 entries, Walter Chase, Madison	$10 00
Best display of c ins (Stone age), 1 entry, C. H. Avery, Madison	5 00
Best display of Indian relics, 2 entries, Walter Chase, Madison	5 00
Best display of books, products of pupils, 1 entry, Northwestern Business College, Madison	10 00
Best display of penmanship, 1 entry, Northwestern Business College, Madison	8 00
Best display of examination papers of public schools, 1 entry, F. O. Burdick, Utica	10 00

Miscellaneous Articles — Not on List.

The following articles received honorable mention from the judges:
Flower painting on velvet and porcelain, Mrs. L. Dutton, Madison.
Linen s ockings and towel, Mrs. D. S. Wilson, Madison.
Shell paintings in oil, Mrs. S. B. Newcomb, Madison.
Photo Chromic paintings, Miss Lois Robbins, Madison.
Crochet table mats, Miss A. Totto, Madison.
Kensington painting, Mrs. Orris Pratt, Spring Prairie.
Block bracket, picture frames and blotting pad, Helga T. Kinterock, Ettrick.

The following articles received diplomas:
Thompson's Universal Garment Cutter, Mrs. M. E. Ringham, Madison.
Inlaid checker board and ladies' work box, Fred D. Fagg, Madison.

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REPORTS OF SUPERINTENDENTS.

DEPARTMENT H — MACHINERY.

To the Officers and Executive Board of the Wisconsin State Agricultural Society:

GENTLEMEN — In submitting an outline of the operations of his department for the current year, with a statement in detail of its exhibits at the State Fair, the superintendent feels great satisfaction and encouragement. The thorough preparations of the preceding year rendered the work of the present lighter and less annoying. A greatly increased interest seemed to result from the enlarged facilities afforded our patrons, and as a result the entries in our department were nearly a third more than for the previous great season of 1883. [425 entries against 349.]

We have heard no expressions of dissatisfaction with either the accommodations or the management of the department. On the contrary, many of its exhibiting patrons have taken especial pains to express their satisfaction therewith.

The superintendent has little to add to the general observations presented in his last report on the character and importance of these annual expositions, of the grand results of agriculture, and of the industrial and mechanical arts which depend immediately upon that pursuit. The constantly augmenting interest shown in these assemblages amply justifies us in our efforts to gratify and promote them by a liberal and active policy of administration.

In a general way it may be said that the state fair of 1884 was a reproduction of its "illustrious predecessor" upon a larger and more splendid scale. The *almost* perfect weather

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of the former season seemed to be made so, *absolutely*, the present season, by the cooler breezes which tempered it. The largely increased attendance — that of Wednesday being estimated at 25,000 — sufficiently attests the esteem which this institution has in the regard of our people. And it will undoubtedly be found that whenever popular interest flags it results from curable causes, and is not inherent in the thing itself.

The superintendent again deems it both just and proper to call attention to the extraordinary enterprise which several of the larger agencies of the manufacturers have shown in the success of this and other of the fairs of our society. In the course of this report allusions will be made to some of the more conspicuous examples; but he desires here to assure one and all, that we fully appreciate these exertions and outlays in our behalf, which have contributed so much toward the general success; and sincerely hopes that all may meet with an exceeding great reward in return.

The plan of the present report is based upon that of the last. It has seemed neither necessary or expedient to the superintendent and "examining committee" to undertake the part of experts and give elaborate descriptions of the various exhibits or attempt any discriminations between competitors. No such precedent has been established, nor instructions given to do so by the board; and in their absence he will pursue the dictates of his own best judgment.

We have it under consideration, however, to recommend to your honorable body that some scheme for competitive tests of "Machinery in Motion" be adopted, and that a general system of awards, comprising medals, diplomas and ribbons for all classes of exhibits in this department be inaugurated. This, we believe, would largely add to the interest and value of these occasions and meet the wishes of exhibitors. It would answer all the purposes of more expensive prize-giving and awards, and still be within compass of the exchequer of this association.

We wish, also, to submit one suggestion more relative to our general interest. Experience and observation have convinced us that the time usually alloted to the fair is entirely

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too short, and that the good of the society and its patrons will be promoted by the extension. The large expense involved in collecting, displaying and dispersing the vast accumulations of these agricultural expositions seems to be hardly compensated by the very brief time alloted to their showing. For the two seasons past the weather has been uncommonly propitious; but had it been otherwise, it would have made all the difference between failure and success. A longer term — say, an extension of one week — would reduce the contingencies of weather, lessen the chances of overcrowding the buildings and grounds, and tend generally to lighten the heavy labors of those in charge, and to promote the comfort of all.

But this improvement can hardly be made possible until the association abandons its migratory career and decides upon permanently occupying and properly improving its fine possessions in the Capital City.

The superintendent was disappointed in not receiving a more general response to his call upon his state fair exhibitors for statistics of the Wisconsin agencies and trade. He believes these to be a matter both of public interest and one which will prove advantageous to the manufacturers. No such statistics would be elsewhere obtainable, that he is aware of.

The importance of a prompt entry of exhibits, to which he alluded before, he would emphasize now, for the benefit of his successor. Much needless trouble and confusion is created by the arrival of so many exhibits at the eleventh hour. Let this be avoided in every possible case, as it is disadvantageous to us all alike.

The superintendent would say to any exhibiting patrons or others, that he will be pleased to send them copies of his State Fair Report for 1883 (so often alluded to herein) upon application to him at Beaver Dam, Wis.

In conclusion he has only to make due acknowledgments to the gentlemen in charge of the agencies and exhibits for their almost uniform courtesy and their kind and considerate treatment; and to his assistants, for their faithful and intelligent service. And he congratulates the grand old Agri-

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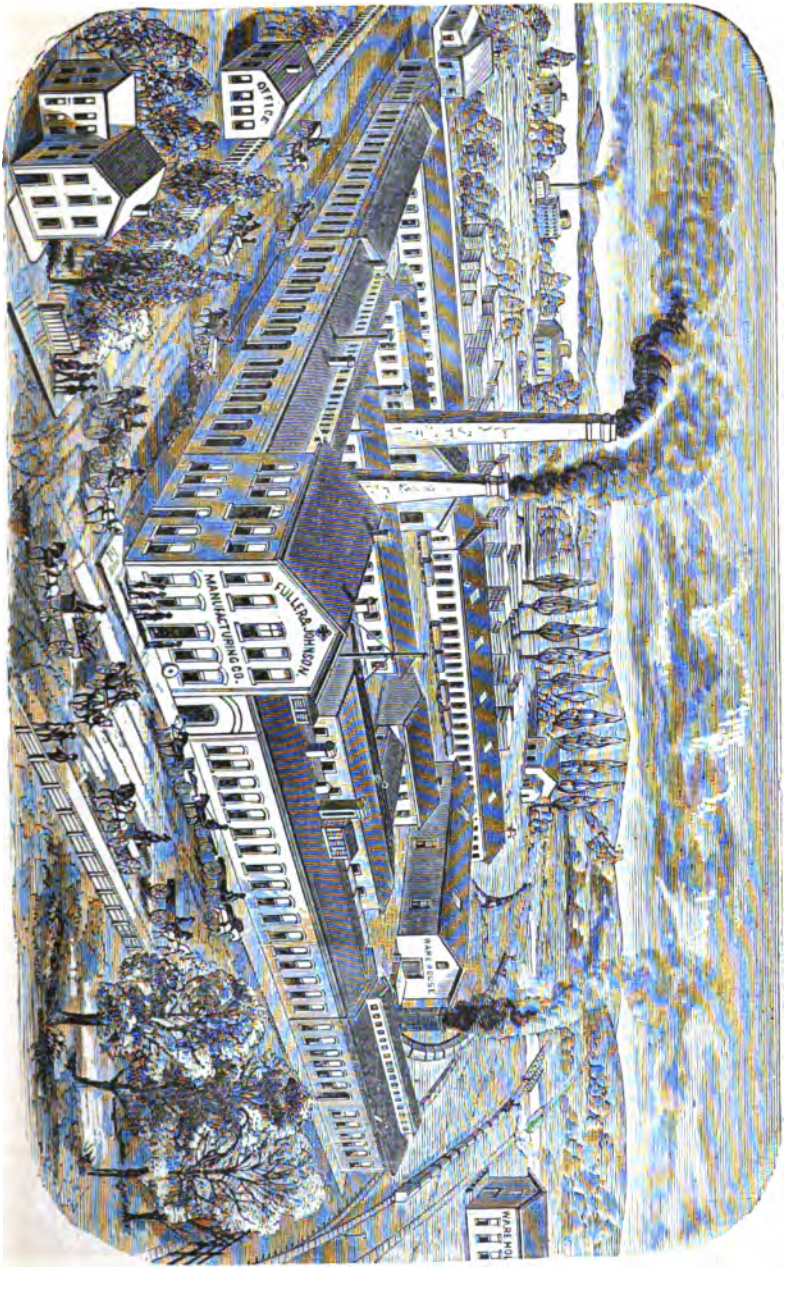

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cultural Society, which we all feel honored in serving, upon its splendid record in the service of the noble profession of Agriculture. This record, now extending far beyond the entire life of the present generation of men, he can but believe and trust, has but just begun.

With this hope, he now resigns the honorable post to which your indulgence assigned him two years ago, trusting that his successor may serve you with greater success if not with greater zeal and loyalty.

Respectfully submitted,

T. L. NEWTON,
Superintendent, etc.

A. A. AVERY,
Secretary, etc.

DEPARTMENT H.

Field Machinery and Articles for Agricultural Purposes.

J. F. Sieberlinger, Akron, O.—
Self-Binding Harvester,
Mower,
Mower (light).

This new candidate for public favor presented a very creditable line of harvesting machines, for which the Buckeye state has become literally world-renowned.

They have not informed us about their business in our state, nor their plans and agencies for pushing it. We hope to meet them regularly hereafter.

Milwaukee Hay-Tool Company, Milwaukee, Wis.—
Single Harpoon Hay-Fork,
Single Harpoon Hay-Fork.
Single Harpoon Hay-Fork,
Double Harpoon Hay-Fork,
Double Harpoon Hay-Carrier.
Reversible Hay-Carrier,
Reversible Hay-Carrier.

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We were pleased to welcome these meritorious inventions of our Cream City Company, and invite our dealers and hay producers to inquire into their special claims.

East Grove Milling and Lumber Company, Downer's Grove, Ill.—

Farm Gate.

A desirable appearing sample of a most convenient Yankee notion.

[No report of their business.]

Warrior Mower Co., Little Falls, N. Y.—

Single Mower.
Double Mower.
Sulky Rake.
Disk Cultivator.
Disk Harrow.

Among the standard makes of eastern goods in this line, we were especially pleased with their improved disk tools, and we advise careful investigation of their practical working.

Consumers and agents will do well to apply to Ben. C. Ferson, 230 East Water street, Milwaukee, for catalogue and lists.

Acme Hay Harvester Co., Peoria, Ill.—

Hay Stacker and Loader.
Hay Rake.

We are always glad to welcome to our grounds implements like these, which promise to reduce the labor and expense of securing the hay crop. These attracted much attention and favorable comment. We cannot, of course, go into details, but we advise all concerned in the solution of the above mentioned problem to correspond with these manufacturers.

Rawson Manufacturing Co.—

Mower.
Reaper.

Our printer of last report owes an apology to this company for calling it *wrong names*, which we regret. In that

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report we passed our approval of their machines; and are glad to refer our friends again to their general agent, Mr. E. H. Gates, 236 Read street, Milwaukee, for fuller information.

Wm. Haak, Madison, Wis.—

Wind-Mill.

We believe Mr. Haak has the agency of the Evansville, Wis., Mill. We know him to be a first-class man in his line, and no one need be afraid of the mill which he recommends.

Evansville, Wis., M'fg Co.—

Wind-Mill.

[See above, Wm. Haak.]

J. P. Phillips & Co., General Agents, Milwaukee, Wis.—

This well-known agency displayed the following line of goods in full operation, viz.:

Sandwich Mounted Sheller.

This has four holes, is eight horse power, with cob-stacker and wagon elevator, and has a capacity of 2,000 bushels per day.

Duke Hay-Tedder.

Each tine is four feet and two inches long.

Reindeer Rake. (Self-Dump.)

Two Portable Engines.

Victor Double Huller.

This clover machine did itself great credit in hulling and cleaning the seed, fit for market, on the ground.

They also exhibited the following stationary line of implements, viz.:

Young Sampson Horse Power. (Eight Horse.)

Captain. (Single Horse Power.)

A fine machine for farm use, high motion and low price.

Comet Sheller. (With fan.)

Prince Sheller. (With table and fan.)

Veteran Sheller — two holes.

This has table, fan and cob-rake, with a capacity of six hundred bushels, and is very easily operated.

I. X. L. Cider Mills.

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This celebrated mill was shown in three sizes.

Richmond Binder Truck.

Shown under a binder, and also with wheels attached to binder, as used in cutting grain.

Farmers' Friend, Planter.

An excellent machine with hand lever and foot treadle.

Hollingsworth Rake.

With hand and foot dump.

Crescent Rake.

With double, independent coil tooth and an overhanging cleaner.

Taylor Rake — Self dump, No. 4.

Surprise Rake — Hand dump.

Kalamazoo Spring-tooth Seeder.

Kalamazoo Sulky Harrow.

Kalamazoo Spring-tooth Floating Harrow.

The above display under Mr. Phillips' able management, was fully equal to, if indeed it was not superior to that made by him in 1883, upon which we congratulated him so heartily.

Stover Manufacturing Co., Freeport, Ill.—

Stover Patent-geared Feed Mill.

Stover Patent-geared Feed Mill.

These popular mills were well shown again, having received our compliments last year. The peculiar gearing by which the *inside* grinding burr revolves much faster than the *outside* one, adds greatly to the grinding capacity. The finish and make-up of these machines, both metallic and wood, seems to be superior and its most valuable features are protected by patents. It is secured to the ground in a much better way than is common. Apply to the company for its well gotten up Catalogue for full and reliable information.

Hiram G. Dodge & Sons, Madison, Wis., General Agents—

Exhibited the following splendid list of agricultural machinery and implements, so well known throughout our state, viz.:

David Bradley Mfg. Co., Chicago, Ill.

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Swing-beam Sulky Plow.
Iron beam Cultivator (with arms).
Combined Cultivator (with spring).
Adjustable Arch Cultivator (with spring).
Hand-dump Sulky Rake.
Hand-dump Sulky Rake No. 2.
Self-dump Sulky Rake.
F. & B. Harrow — 2 sections.
Eclipse Harrow — 3 sections.
Wood Field-Roller (24 inch).
Nine assorted Plows.

This is the well-known successor of the great Furst & Bradley Company whose fine display was made the subject of our commendation in the preceding report. We can now only emphasize the opinions then given and extend our cordial wishes for the prosperity of their successors. Their interests are in good hands at the Capital City of Wisconsin.

Moline Plow Works —

Four (assorted) Plows.
Flying Dutchman Sulky Plow, the famous 3-wheel implement.
Hay Rake (new).
New Western Spring Cultivator.
Pearl Riding Cultivator.
Smoothing Harrow, 145 teeth, is novel and instantly changed from a rigid tooth or Scoth harrow into a slanting tooth or smoothing harrow.
Three Horse Equalizer is also worthy of notice.

Altogether a fine display, finely shown by Messrs. Dodge. We need not go into the merits of so long and favorably known an institution, but only reiterate our formerly expressed opinion.

Johnston Harvester Co.—

Mower, Front-cut, changeable speed.
Mower, Rear-cut.
Continental Single Reaper.
Combined Mower and Reaper.
Harvester and Binder.

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This is also a repetition of the large display of last season for which we could find nothing but words of commendation. It was handled so as to *show its best* by the Madison Agency, Dodge & Sons.

Appleton Manufacturing Co.—

Badger Seeder (Improved).

A sample of the excellent work done by this large concern in the City of Appleton, which is rapidly becoming the Emporium of Badger State Manufacturing. The claims of this Seeder to special merit, seem to be these, in part. 1st. A more even distribution of seed. 2d. Obviating the necessity for changing gear wheels. 3d. No necessity for changing a peck at a time. 4th. The only four-point vibrating tooth in use. 5th. Steel axles. Other claims are also made.

Jno. P Manny & Co.—

Independent Self-Rake Reaper,
Mower.

This old pioneer, who "showed up" handsomely last year were well represented by Messrs. Dodge & Son this year. Of course they attracted the attention they merited. Their new short-stroke cutting apparatus seems to cover a new and important principle By this, the knives reciprocate from edge to edge, instead of from center to center, though the guards are in other machines, We recommend those interested to correspond with their agents named above. We are informed by the Company that their state trade is good.

Springfield (O.) Manufacturing Co.—

Self-dump Hay Rake,
Foot-dump Hay Rake,
Portable Engine and Thresher,
Improved Woodbury Horse Power,
Vibrating Separator,
Steam Power Separator,
New Traction Engine,
Water Tank on Wheels,
Portable Engine, 12-horse power.

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This large and important display of the Buckeye concern, so well handled by Dodge & Sons, constituted, of course, a most interesting and attractive feature of the state fair of 1884. The portable engine, which operated one main line of the shafting, was considered, by many, the lightest and most powerful steamer at work on the grounds. The combination of power and lightness, in fact, is a special claim of these makers' machines. This, with great economy of fuel, certainly entitles them to a trial.

Taft Road Scraper.

This machine, we are fully authorized in stating, to be the most satisfactory and reliable in the province where it belongs. Those who saw its work on the fair grounds will need no assurance of this. Those who did not can easily convince themselves of the truth of this statement by corresponding with its agents, Messrs. H. G. Dodge & Sons, of Madison, and the references they can supply. We feel that we are doing the public a service by inviting attention to its merits. We hope to see it on hand the coming season.

Hoover & Gamble, Miamasbury, O,—

Excelsior Harvester and Binder.

Excelsior Harvester and Binder, No. 2.

This prominent firm, who were the pioneers of the Self-Binders, were represented at the fair of '83, as at the present, by Messrs. Dodge & Sons, are well entitled to the attention of the agents, dealers and farmers for the superioriry of their wares.

We may be permitted to mention merely, a few of their distintive and valuable points in the Harvester.

1st. It is well and evenly balanced at all times, — the weight resting on the wheels and not on the horses. 2d. It has a long range or tilt and works light, necessarily. 3d. (and a very important point too) is the facility with which it makes bundles of any size at will. "A very obvious advantage" as we said in our last report. 4th. The new patent bundle ejector is a device of practical utility.

Other points might be allude d to, such as running the sickle in a rocker shaft, avoiding dead centres, and facili-

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tating the removal and replacing of the knives, the conveyors and elevators, and adjustable reel.

The Mower is very light and runs well in the heaviest grass.

Their agents can furnish ample and unqualified testimonials from Wisconsin farmers, upon application.

Gesley Brothers, Beloit, Wis.—

Sulky Plow.

Bicycle Plow.

Favorably noticed upon last year's exhibit. We are glad to learn of a substantial increase in the business of this deserving firm.

With this, we close the list of exhibits handled and displayed in fine style by the Messrs. H. G. Dodge & Sons of our capital city.

We need hardly say that the interests of manufacturers are closely attended to by these genial and enterprising gentlemen. And this department is under many obligations to them for attentions which it needed and appreciated.

A. S. Brown, Madison, Wis.—

Exhibited the following important line of farm machinery, etc.:

McCormick Harvester and Binder.

McCormick Harvester and Binder. (Steel frame.)

McCormick Mower.

McCormick Daisy Reaper.

We were glad to see these products of the great pioneer firm of Chicago again within our grounds. We need do nothing more than mention their familiar and honored names. Their new departure in framing their machines in steel appears to us to be about the most important improvement since the binder was perfected.

Nichols & Shepard, Battle Creek, Mich.—

Traction Engine.

Vibrator Thresher.

Vibrator Thresher.

Portable Engine.

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This well-known firm were with us again, and were ably represented by their general state agent, Mr. J. H. Topping, a gentleman whom we are always pleased to greet.

Their plain and traction steamers and original vibrator separator, all in operation, gave ample opportunity for investigating their merits, which was not lost by the vast concourse of people, and the verdict was most favorable. The manner in which the Traction was handled seemed wonderful, and elicited general attention and admiration, drawing spectators even from the racing. It ran slow or fast, stopping instantly, going forwards and backwards, making circles, and appearing more like "a thing of life" than a mere piece of machinery. These engines and separators were admired by all as being the most complete and easily handled; and we shall expect them with us at the coming state fair.

Scobie Flexible Harrow.
Acme Pulverizer.
Miller Spring Cultivator.
Standard Sulky Cultivator.
Grand de Tour Cultivator.
Big Giant Corn and Cob Grinder.
American Feed Grinder.
Tiffin Corn Sheller.
Barlow Corn Planter.
Superior Drill.
Superior Seeder.
Fairbanks' Scales.
American Cider Press.

These well known and generally approved implements, were, for the most part, made subjects of favorable mention in our last year's issue.

The above constituted Mr. Brown's well managed contribution to the last fair. We understand that it has now been consolidated with Mr. Sheldon's stock and business.

W. H. McFarland, McFarland, Wis.—

Post Auger.

This product of Dane county genius approved itself to

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the superintendent of this department. It worked fast and well, and seemed to bear out the inventor's claims of "superiority for use in every kind of soil."

M. K. O'Connor, Howard, Ill.—
Hay Elevator and Carrier.

Another competitor for the honors and awards of this great branch of farm industry. It seems entitled to the attention which it demands.

Mast, Foos & Co., Springfield, O.—
Iron Turbine Wind Mill.
Buckeye Force Pumps.
Lawn Mowers.
Ornamental Iron Fencing.
Horse Reels.

We retract nothing of our complimentary expressions in last report concerning the exhibit of this firm, which is same as for '83, with the additions of the last useful articles. On the contrary, we are confirmed in our good opinion of their very substantial and unique windmill, and propose to secure one for use on our own farm. We are induced to do this by the testimony of farmers in the southern portion of our state, where it is largely coming into use and seems to be universally approved.

Trahern Pump Co., Rockford, Ill.—
Assortment of Iron Pumps.

We have long known Mr. Trahern by the reputation of his goods, which stand in the front rank with dealers in that line. We are glad to see his samples here. Buyers and agents will do well to consult his handsome and well illustrated catalogue of cistern and well supplies, which has just issued.

Eclipse Wind Engine Co., Beloit, Wis.—
[E. Morden, Agent at Madison.]

The old Pioneer and Standard Mill was in charge of the local agent. In addition to our notice of it at our preceding fair, we may add that recent changes in its construction, by which its speed can be regulated from below without the

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necessity of ascending the tower, gives it great advantage over others and will be highly approved of by its patrons. Other improvements that experience seems to demand, are constantly being made, amongst which are some designed to add to its capacity for self-protection and self-regulation under the ever-shifting circumstances of wind and weather. We are not surprised to note a substantial increase in their Wisconsin trade for 1884. *Forty per cent.* is a large increase under any state of things, and especially so in the existing business depression. And it is reasonable to conclude, therefore, that their implements are regarded as articles of prime necessity by agricultural users especially.

Janesville Machine Co., Janesville, Wis.—
Leader Drill.
Prairie City Seeder.
Crown Mower.
Crown Reaper.

Exhibited in 1883, and indorsed by us as good. We are gratified to learn of the growth and prosperity of this prominent institution of our beautiful Prairie City, and cheerfully counsel all interested to investigate the merits of these home-made machines.

D. M. Osborn & Co., Auburn, N. Y.—
Twine Binder.
Single Reaper.
Mower.
Mower.

The fine display by this well know Empire State Manufacturing Co., for 1883, was repeated in 1884. We have received no statistics of their trade in our state.

Peerless Reaper Co., Canton, O.—
Combined Reaper and Mower.
Single Reaper.
Rear-cut Mower.
Front-cut Mower.

These machines were shown again in excellent style and confirmed in us the good opinions of them which were formed

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and expressed by us in 1883. They have not as yet given us a statement of their Badger State business since the last named year, at which time there were over 100 agencies of theirs in our midst, some of which sold one hundred machines each.

Russell & Co., Massilon, O.—

Traction Engine, 10 horse power.
Massilon Separator, No. 8.
Water-Tank, 4 wheel.
Patent Straw Stacker.
Portable Engine, 6 horse power.
Massilon Engine—new, No. 5.

The very attractive and important showing made in 1883, on our grounds by this extensive eastern company, was enlarged this season by the addition of the two steamers last on their list, which are also fine samples of their work. Their light engines, equal to ten horse power with its threshing outfit, will, we are quite sure, prove greatly economical and convenient as compared with the ordinary horse equipment so commonly used. We take much pleasure in refering consumers of these commodoties to their established agency in Wisconsin. Address Russell & Co., Milwaukee, Wisconsin.

[No statistics have been given us.]

Walter A. Wood & Co., Hoosick Falls, N. Y.—

Twine Binder and Harvester.
Twine Binder and Harvester.
Mower.
Reaper.

The Chicago Agency of this leading concern in the Harvesting Machine development, placed their list on trial in fine shape and made a most excellent display and impression. We need not comment upon makes so long before our public and which have approved themselves by experience. Mr. A. S. Brown had charge of their goods here at the previous fair. We have not been recently advised of the extent of their sales in our commonwealth.

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Dennett Harvester Co., Milwaukee, Wis.—

Harvester and Binder.

Mower.

This creditable display of the products of the shops of our Badger Metropolis we were glad to welcome to our Capital City's Fair Grounds. Every contribution towards lightening the labors of the harvest field not only adds to the sum of human comfort, but cheapens the cost of living. These machines seem to be gaining appreciation and patronage, in spite of the heavy competition to which all new manufacturers of such implements are subjected. We wish them well.

Anthony Lifting Jack—

H. J. Hill, Agent, Madison.

Exhibited in operation again this year. Reference is made to our last year's notice of it, in which it was improperly described as "a Tripod." Available whenever enormous lifting and moving power is required at small outlay. Capacity, 8 tons; weight, 150 pounds; cost for machine, $35.

Whitman Agricultural Works, St. Louis, Mo.—

Hay Press.

Broadcast Seeder.

This is the first appearance with us of this celebrated St. Louis company. Their "Continuous Hay and Straw Press" has long been known to us, having been sold extensively in Wisconsin, for many years past. We have received from them a very pleasant acknowledgment of the important service rendered them by our society, through the medium of the state fair, in increasing their sales of goods exhibited. We have no hesitancy in recommending such as we have seen and shall be glad for a full exhibit hereafter. The Empire State Agricultural Society awarded them the grand gold medal for Hay Presses last year, and other prizes for the past four years successively.

J. W. Bookwalter & Co., Springfield, Ohio.—

Self-dump Rake,

Hand-dump Rake,

Hay Tedder.

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Among the most creditable exhibits in our department, we noted the above list by this firm of established reputation. We are informed that they have a large sale. by their big jobbing house, throughout the entire west, and are rep. resented in our own "Cream City" by the well-known firm of Lindsay Brothers, Milwaukee.

Slosson & Jones, Racine, Wis.—

Hay Press.

We mislaid our papers relating to this exhibit, and failed to receive a response from the firm in time for this report This, also, we hope to make reparation for after the fair of '85, at which these and all other of our friends are duly expected.

Emerson, Talcott & Co., Rockford, Ill.—

Standard Mower,
Standard Reaper,
Steel-frame Cultivator,
Wood-frame Cultivator,
Corn Planter,
Check-rower.

These old and tried friends of our fair and of our farmers, are always promptly on hand with their "good works." Both they and their productions are so well known to the trade and the consumer that we spare comment, and only call attention to the above list of their last exhibit.

American Well Works, Aurora, Ills.—

Wind Mills.
Well Tools.

We were exceedingly interested in this large and unique display of well-sinking machinery and tools made by this leading concern, in their line. And we have since taken great pleasure in examining their full and complete illustrated catalogue, pertaining to the methods and appliances of this new but rapidly growing art. *Our* farming community is peculiarly concerned in whatever promises a cheap, permanent and *pure* water supply, on account of the large stake in dairying and stock-growing. We cannot do better

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than advise those in quest of aid or information in this matter to apply to these gentlemen.

H. C. Purdy, Viroqua, Wis.—
Farm Gate.

We can only repeat the remarks heretofore made relative to the importance of every-day conveniences like this on the farm, and direct attention to Mr. Purdy's invention.

N. T. Askew, Madison, Wis.—
Sickle-Grinder.

This capital city invention promises to relieve this annoying task, and we recommend a trial. Correspond with inventor at above address.

H. O. Lewis, Portage, Wis.—
Spring Cultivator Attachment.

A new device for attachment to any cultivator; and the patentee will be glad to convince any applicant of its merits.

A. Arnolds, Milwaukee.
Feed Cutter and Power.

We did not get a chance to examine this closely, but it claims some new points of advantage which enquirers can get on application at above address.

Lake City Tool Co., Madison, Wis.
Two Duplex Wind-Mills.

Made upon Conradsen's patents. This new and peculiar device was noticed favorably last year by us, and some points of superiority described. We have had no report of its record of business growth, as yet.

J. R. Jones, Rockton, Ills.
Fanning Mill.

This comparatively recent addition to grain cleaning implements attracted its share of notice, but we were unable to give it the attention it called for. We have not yet received any report upon its claims and success.

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H. A. Webber, Rockton. Ill.

Fanning Mill.

The remarks above made, relative to Mr. Jones' machine of same place are equally applicable to his neighbor, Mr. Webber. We hope to see both of these gentlemen with their specialties another season, and promise them better attention.

Wm. Deering & Co., Chicago —

Six-foot Harvester and Binder.
Standard Binder.
Mower, four-foot cut.
Light Reaper.
Binder and Truck.
Giant Mower, six-foot cut.

The interests of these standard machines were looked after by themselves this season. They were in charge of Mr. A. S. Brown the year before and were noticed in our report. We need only to refer to this exhibit, for it is the ripe fruit of one of our oldest and largest (probably now the largest) concern in existence engaged in making this line of machinery. Their new extra width of harvesters and mowers, seem to promise special advantages in the economy of securing grain and hay. We regret not having received as yet the figures of their trade in our state.

J. A. Field & Co., St. Louis, Mo.—

Mountain City Feed-Mill.

We do not remember to have seen this Feed Mill at our fair heretofore. It is an old standard in the territory tributary to the city where it is built, and enjoys great popularity. We recommend it for trial, though we have not been advised by the firm as to its agencies in our state and hence cannot direct enquirers elsewhere than to its headquarters.

[S. L. Sheldon, agent.]

Henry Knight—

Reversible Seeder.

We were unable to find this exhibit. Perhaps it may be

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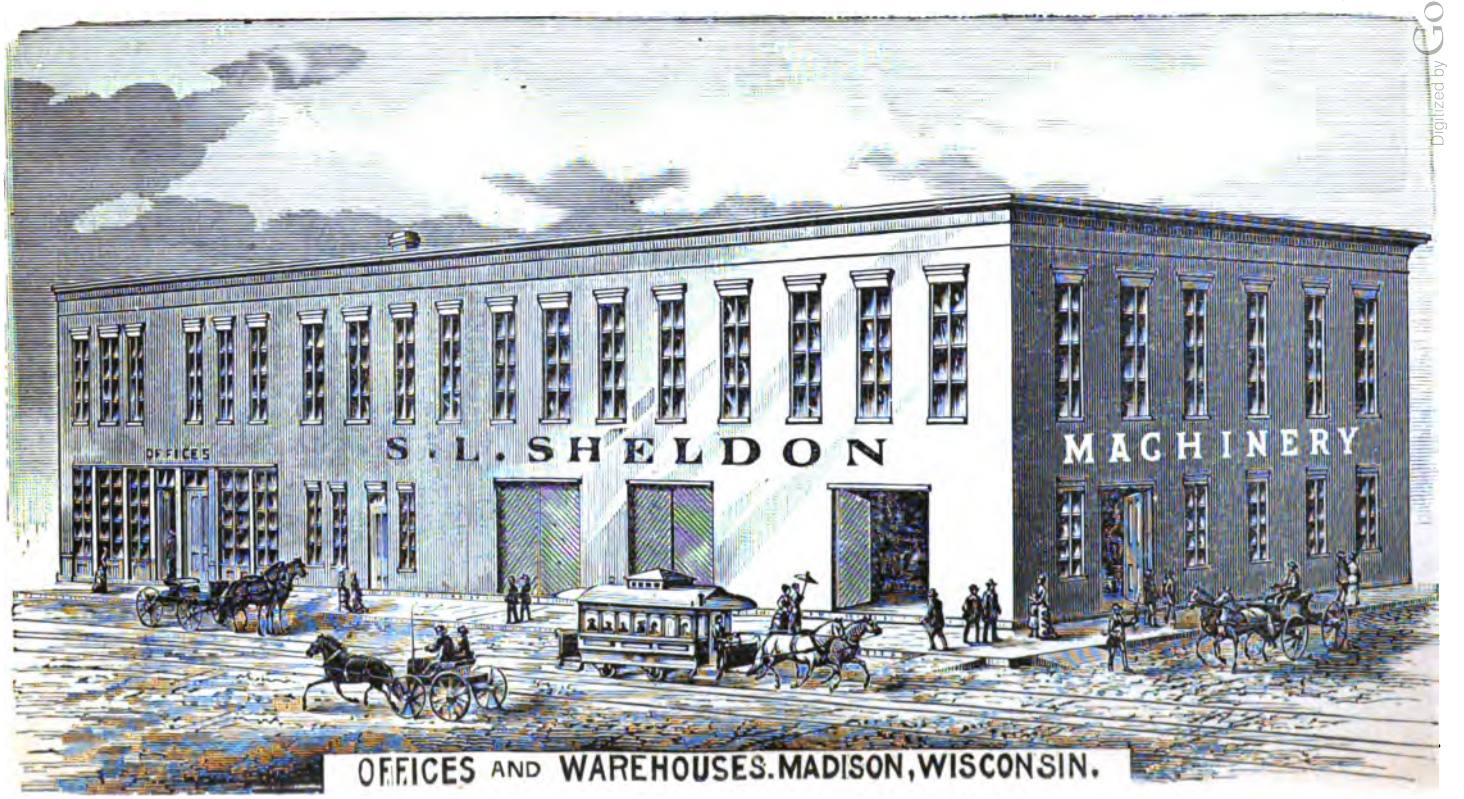

OFFICES AND WAREHOUSES. MADISON, WISCONSIN.

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amongst those of the larger agencies, will try and find it another year.

Deere & Mansur, Moline, Ill.—

Corn-Planter.
Check-Rower.
Horse-Drill.
Broad-Cast Seeder.

We were glad to see these old favorites of the Western Grangers again in their places at our fair. This is classed amongst the larger manufacturing establishments and they report a steadily increasing trade in Wisconsin where the best machinery is demanded.

[See our former report.]

Wheel and Seeder Co., Fond du Lac, Wis.

Two-Horse Rake.
One-Horse Rake.
Hay Tedder.
Harrow.
Hay Carrier.
Grapple-Fork.
Pulleys.

Another display, namely of different line of its utensils, of the desirable and substantial goods of this Badger State concern, which was made the subject of honorable mention in our issue of 1883.

They have not supplied us with the figures of their agencies and sales, but we apprehend they are prospering.

Plano Manufacturing Co., Plano, Ill.—

Plano Harvester and Twine Binder.
New Warrior Mower.

These machines, which disappointed us by not appearing last year (through the fault of the transportation companies), were promptly in line this season and contributed their full share to the interest and success of our grand fair. The company is comparatively a new one, but its excellent work is building up for it a reputation equal to the older concerns. Their officers are all said to be experienced machine build-

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ers, and led the way in the construction of the light mowing and harvesting implements, so much in use at present. Its more characteristic features and claims seem to be these:

1st. The improvement in outside gearing, the main gear being outside the bull-wheel, thus relieving the grain-wheel of weight and avoiding side-draft. This arrangement gives direct connection between the crank and sickle, and does away with the friction incident to the usual sway-bar connections and its parts.

2d. In the wood-work some changes are made in the common methods of framing and bracing, which appears to insure lightness and at the same time save the strength of the machines.

3d. Its later improvements, such as the "screw-tilt," "binder-shifter," etc., appear worthy of approval.

The Company propose putting up 10,000 binders for the trade of the ensuing year, but apprehend this will not supply the demand Their interests in our state are well cared for by their courteous agent, Mr. E. O. Jones, of Cambria, Columbia county, to whom we take pleasure in referring all applicants for these goods.

Hiram Holt, East Wilton, Maine—

Lightning Hay Knife.

We have found this to be the easiest and fastest working tool for its purpose we have ever tried. Even in loose hay and straw, which is the severest test, it does well. We are glad to know that they are being extensively introduced among our people. J. E. Hodgkins, agent. [We have not got his P. O.]

Baker Manf'g Co., Evansville, Wis.—

Two Wind-Mills.

We believe this to be a new candidate in this direction, but had no chance to investigate its merits, and no response has been made to our request for its report, so we must postpone further comment.

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O. C. Vaughn, Jefferson, Wis.—

Jefferson Sulky Corn Cultivator.

Jefferson Harrow.

These implements were shown here in '83, and favorably noticed in our report. They are spoken of with great commendation by practical farmers in the central portion of the state and appear to be growing into general use and favor. Amongst their special claims are, extra size of the sulky wheel, the easy adjustment to width of row and steel teeth. The harrow is self-adjusting, and both articles appear well made in all respects. A. Flom, agent, Madison, Wis.

M. O. Smith, Chicago—

Folding Sawing Machine.

This is another exhibit which we failed to locate. We have written for report, etc., but it has failed to come.

Belle City Mfg. Co., Racine, Wis.—

Feed and Ensilage Cutter.

A part of last season's exhibit. A new principle in cutting, whereby machine section blades are used, which are easily removed for sharpening. It is claimed to work easier and run lighter than other makes, besides being a perfect self-feeder. This company also builds Root Cutters, Truck and Feed Carts, Chaff Carriers, Locks for Wagon Brakes, Hay Forks, etc., and we suggest that they send in a full line at our ensuing fair.

S. K. Ellsworth, Agent, Madison, Wis.—

Champion Binder.

Champion Light Reaper.

Champion Light Mower.

Champion Light Mower, Front Cut.

Captain Ellsworth repeated the fine exhibition of his machines which he made at our previous state fair. As we have said before of these Standard Harvesters and Mowers, they "need no introduction" or endorsement from us. Their fame has gone out with *themselves*, unto the ends of the earth. We are sorry not to have received their statistics of Wisconsin trade in time for this report.

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Henry Weigand, Merrimac, Wis.—

Potato Bug Picker, Wiskocil's Patent.

We should call it a *gatherer* rather than a *picker*, and it is a small hand vehicle on two wheels, which works three fans that brush the bugs into a box. It is claimed to work perfectly and accomplish its purpose, but we had no chance to see it *amongst the vines*. Those interested can address Mr. Weigand, as above.

M. Daley, Watertown, Wis.

Barrel Cart.

Adjustable Harrow.

Mr. D's Barrel Cart seems to us the best device of the kind which we have seen. Both implements, in fact, look practical, cheap and serviceable for their purposes.

David Stenssy, Monticello, Wis.—

Field Roller.

Mr. S., we learn, is a professional agricultural inventor and expert. We failed to get the report which he sent us.

Eagle Fork Co., Appleton, Wis.—

Hay Elevator and Carrier.

Hay Elevator and Carrier.

Assortment of Hay Forks.

The superintendent of this department, in a private letter to this company, expressed his own views of the value of these haying tools, thus: "They are all you claim for them. They are, to haying, what the Twine Binder is to harvesting." This opinion was the result of a thorough, practical test of them.

Challenge Fire Extinguisher Co., Chicago.—

Fire Extinguisher.

We were unfortunate in not seeing this exhibit, and have no statement about it from the proprietors.

Monitor Works, Beloit, Wis.—

Harmless Barbed Wire.

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This is an entirely new departure in this great industry, and claims to obviate the only objection to the use of barbed fencing, viz., its "cruelty to animals." This it does by the use of a small, revolving, saw-tooth steel disk. Many practical farmers endorse it heartily; amongst them is Hon. Clinton Babbitt, the well-known secretary of our own State Agricultural Society, who calls it "a *punisher* rather than an *executioner* of unruly stock," and regards it as *the coming* fence wire. A very large and rapidly growing trade is reported by this concern, to whom any inquiries may be addressed.

Thorn Wire Hedge Co., Chicago.—
Kelly Steel Barb Wire.

This well-known standard was shown up and looked after by Mr. F. E. Hoyt, agent.

Van Brunt, Davis & Co., Horicon, Wis.—
Grain Drill. (Force feed.)
Broad-Cast Seeder and Cultivator Combined.

These specialties of this popular company require no eulogy from us. We refer to our opinion as briefly condensed into our report of the preceding fair. They are kept abreast with the times in everything which pertains to improvement and finish.

A. H. Krogle, Cambridge, Wis.—
Steam Engine.

This steamer was one to which our attention for some reason was not called.

B. Colvin, Freeport, Ill.—
Rotary Hand Cultivator.

A queer looking device, which proposes to do the work of the hoe at great economy of time and labor, and to supersede it in time.

Fuller Johnson M'f'g Co., Madison, Wis.
Riding Cultivator (4 shovel).
Walking Cultivator (3 shovel).

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Combined Cultivator (5 shovel).
Double-Shovel Cultivator, wood beam.
Double-Shovel Cultivator, iron beam.
Bonanza Corn-Planter.
Bonanza Sulky Rake.
Star Sulky Rake.
Bonanza Harrow (72 teeth).
Wave Harrow (80 teeth).
Steel Harrow.
Grub-Breaker Plow (14 in.).
Brush-Breaker Plow (14 in.).
Mower, Bartlett-tilt.
A. 15, Plow.
D. 85, Plow.
D. 89, Plow.
C. 55, Plow.
Mower, "Red, White and Blue."

This enterprising Capital City Agricultural Manufacturing Company exhibited the above very fine and full display of their wares. We referred to them with much satisfaction in our last report. Their goods are noted for many excellent points. Their Mower has brass bearings, is of extra width between wheels and has enclosed dust proof gearings. The wheels are high, affording easy draft. The cutting apparatus with its device for adjusting height of cut is very superior. Their Sweepstakes Rake has high wheels and a trussed axle to prevent sagging. Their Corn-Planter with its high wheels, large and strong steel axles, and with its joints strengthened by iron plates, is certainly commendable. It will plant in rows 3 ft. 6 in. or 3 ft. 9 in. as desired. The slide bar hangs in hinges and moves with great ease. But its special and crowning feature is the force-drop, recently patented, whereby the seed is *made* to drop in the right stop, no matter what may happen. This is an advantage which even farmers must appreciate. Their plows, which are a specialty, we need only allude to. The famous Firmin-Billings-Plow concern constitutes a leading feature of the present company. We notice extensive enlargements and improvements about their already

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immense plant which betokens a prosperity which honest merit only acquires, in their branch of trade. Their new and very handsomely illustrated descriptive catalogue and list will furnish complete information to all who apply to them for it.

S. L. Sheldon, Madison, Wis.—
Birdsell Clover Huller.
Acme Riding Cultivator.
Acme Thresher and Separator.
"Deere" Walking Cultivator.
Gilpin Sulky Plow.
Matchless Cultivator.
G. P. No. 15 Plow (two).
I. X. L. No. 3 Plow.
Potato Digger.
Winona Harvester and Binder.
Winona Mower.
Sulky Tign Rake (three).
Disk Harrow.
Seeder.
Drill.
Tedder.
Mower.
Acme Harrow and Pulverizer.
J. I. Case—Plow, 84 M.
Plow, 83 M.
Plow, 83 G. M.
Plow, 84 G. M.
Clipper Plow, sulky (15 inch).
Plow, 34½ G. M.
Plow, 34 G. M.
Riding Cultivator.
Adjustable Harrow.
Plow, No. 74.
Plow, No. 64.
Winchester & Partridge—Feed Mill.
Sheller and Grinder.
Sheller and Grinder.

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S. L. Sheldon, Madison, Wis.—

P. P. Mast & Co.—Drill, 12 hoe.
Seeder, 12 hoe.
Cider Mill.
Buckeye Hay Rake.
Harrow, 15 tooth.
Cultivator and Leveler.
Seed attachment for harrow.

J. H. Thomas & Sons—Hay Tedder.
Hay Rake.
Hay Rake.
Hay Rake.

A. W. Coates & Co.—
Lock Lever Rake.

H. C. Staver & Co.—
Lake City Feed Cutter.
Two Hole Sheller and Locker.
Feed Mill—power attached.

D. S. Morgan & Co.—
Triumph Reaper.
Clipper Mower.

J. S. Powell & Sons—
Tiger Seeder.
Combined Drill.

Pitt's Agricultural Works—
Pitt's Separator.
Pitt's Separator.
Pitt's Engine.
Pitt's Engine.

Keystone Manufacturing Co.—
Hay Tedder.
Rotary Planter.
Feed Cutter, No. 1.
Disk Harrow, No. 2.
Self-dump Rake.
"Dude" Sheller.
"Trump" Sheller and Power.
Medium Cider Mill.
Pony Sheller.

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S. L. Sheldon, Madison, Wis.—
Eureka Manfacturing Co.—
Seeder.
J. J. Budlong & Co.—
Disk Harrow.
Boss Harrow Co.—
Two-Horse Harrow.
Three-Horse Harrow.
Adjustable Harrow.
Skandia Plow Co.—
Corn-Planter.
Check Rower.
Sulky Plow, 16 in.
Assortment of Plows.
Skondia Jointer.
Sterling Manufacturing Co.—
Hay Tedder.
Potato Digger.
A. Turner —
Binder Truck.
Oliver Chilled Plow Works —
Casaday Sulky Plow.
Assortment Walking Plows.
Esterly Harvester Works —
Light Twine Binder.
Medium Twine Binder.
Mower.
Wyckoff & Tuttle —
Harvester and Binder.
Perry Royce Reaper.
Perry Royce Mower.
Gregg & Co.—
Meadow King Mower.
Self Rake Reaper.
Self Rake Reaper.
Binder.
Briggs & Enoch Manufacturing Co.—
Stalk Cutter.
Planter and Check Rower.

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S. L. Sheldon, Madison, Wis.—
Briggs & Enoch Manufacturing Co.—
One-Horse Planter.
Breaking Plow, 12 in.
Double Shin Plow.
Double Shin Plow.
Assortment of Plows.
New Rolling Coulter.
Sod Breaker for Planter.
Norwegian Plow Co.—
Assortment of Plows.
W. D. Clipper Plow, 14 in.
S. B. Clipper Plow, 14 in.
Brush Breaker Plow, 14 in.
S. P. Harrow (two sections).
Tilting Harrow.
Malleable-Iron Harrow.
Large Cultivator.
Rolling Coulter, S. B.
Riding Cultivator.
Riding Cultivator — foot lift.
Walking Cultivator — spring lift.
J. I. Case & Co.—
Separator.
Ten-Horse Traction Engine.
Knowlton Mfg. Co.—
Mower.
Riding Cultivator (No. 3).
Riding Cultivator — 6 shovel.
Pole Rake (No. 1).
N. C. Thompson Mfg. Co.—
Pole Tedder.
Thill Rake, (No. 1).
Gorham Sulky Cultivator.
N. C. T. Sulky Cultivator.
Steel Wheel Sulky Cultivator — iron beam.
Walking Cultivator — iron beam.
Tongueless Cultivator.
Assortment of Plows.

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S. L. Sheldon, Madison, Wis.—
N. C. Thompson Mfg. Co.—
Stalk Cutter.
Scotch Harrow.
E. G. Douglas—
Champion Hay and Grain Loader.
S. P. Van Vleck—
Hay Unloader.
Beedle & Kelly—
Corn Planter.
Corn Planter.
Sulky Hay Rake.
Check Rower.
Hart, Hitchcock & Co.—
Shelling and Grinding Machine.
Cooper Traction Engine.
Ames' Portable Engine.
Wm. Anson Woods Mower.
Corbin Disk Harrow.
Church's Hay Carrier.
Betts' Hay Carrier.
Betts' Hay Fork.
Coates' Sulky Rake.
Sheldon Saw Frame.
Common-Sense Potato-Digger.

The immense and magnificent exhibition made at last year's state fair, by Mr. Sheldon was increased and even improved upon in some respects by that of 1884. But few know the large outlay, both in money, time and tact, involved in the arrangement and conducting of these extensive displays of machinery in motion, and large lines of tools and implements of myriad-handed husbandry.

We take great pleasure in making reference to the opinions and indorsements given of this Agency, and its energetic proprietor, in the report of 1883, for this department. We gratify ourselves and do our friends and patrons a favor by commending such gentlemen to public favor. With their knowledge and ripened experience in their profession, and

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their known pecuniary responsibility, neither dealer nor user of these wares can do better than to consult with them and invest upon their recommendation.

DEPARTMENT B — CATTLE.

GALESVILLE, WIS., Dec. 8, 1884.

To Clinton Babbitt, Secretary of Wisconsin State Agricultural Society:

DEAR SIR — I would most respectfully report as superintendent of Department "B,"—Cattle, at the state fair held at the society's fair grounds, Sept. 15th to 19th, inclusive, as follows:

Robert Mil'er, of West Liberty, Iowa, exhibited ....18 Short Horns.
Joseph Kiser, of Oregon, exhibited. .....24 Short Horns.
John Sprecher, of Madison, exhibited..... 5 Short Horns.
Seth Fisher, of Center, exhibited .....15 Short Horns.
S. S. Brown & Son, of Galena, Ill., exhibited..... 8 Short Horns.
J. W. Scoville, of Lowville, exhibited..... 6 Short Horns.
Thos. Little, of Janesville, exhibited .... 1 Short Horn.

77

H. Bullard, of Evansville, exhibited..... 3 Jerseys.
Wm. Welch, of Madison, exhibited..... .... 1 Jersey.
Geo. Thatcher, of Black Earth, exhibited ..... 5 Jerseys.
C. B. Miller, of Madison, exhibited.....12 Jerseys.
J. B. Stone, of Oregon, exhibited..... 1 Jersey.

22

A. E. Baker, of Hustisford, exhibited.....17 Devons.
John W. Morse & Son, of Verona, exhibited.....25 Devons.

42

Wm. Steel, of Merton, exhibited..... 3 Red Polled.
Abbott & Sons, of Woodstock, Ill., exhibited..... 7 Aberdeen Angus.
Anderson & Finley, of Lake Forest, Ill., exhibited....17 Polled Angus.
J. H. Carpenter, of Madison, exhibited..... 2 Polled Angus.

29

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H. H. Davis, of Madison, exhibited..... 4 Holsteins.
T. K. Gillett, of Rosendale, exhibited.....18 Holsteins.
Vanduhf & Cob, of Bloomington, exhibited .....11 Holsteins.
Barber & Randall, of Hustisford, exhibited..... 9 Holsteins.
L. B. Leonard, of Lake Mills, exhibited..... 8 Holsteins.
A. H. Wagerman, of Lake Mills, exhibited..... 2 Holsteins.
T. W. Laramy, B loit, exhibited.....20 Holsteins.
F. W. Maxon, Walworth, exhibited..... .. 9 Holsteins.
S. S. Mann & Son, of Elgin, Ill., exhibited..... 16 Holsteins.
J. T. Jackson, of Marshall, exhibited..... 1 Hosltein.

93

Grand total..... 263

This was one of the best, if not the best show of breeding cattle shown at any state fair held in the United States the past year. The number of cattle was not only large, but by all competent judges the exhibits of Shorthorns, Devons, Polled Angus and Holstein would do credit to their owners at any fair in this country or any other. The premium list will show who were the recipients of premiums, therefore it does not become me to farther particularize. At this time, as heretofore, I desire to express my sincere thanks for the unrewarded services of the various committees that judged of cattle's comparative merits and for the courtesy of the breeders and their quiet and apparently willing acquiescence in the various awards of the committees.

I would recommend that for the next fair most of the sweepstake premiums be put in various herd premiums. That in awarding premiums on which there is no competition the animal be awarded either first or second premium according to its individual merits, as compared with the best specimens of the particular breed.

That the fat cattle premiums be so arranged that the owner of even one fat animal could compete for a premium, and that no silver plate be offered on premiums in this department except diplomas and cash.

All of which is respectfully submitted.

ALEX. A. ARNOLD,
Supt. Dept. B., Cattle.

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DEPARTMENT K.—FINE ARTS.

To the Executive Board of the Wisconsin State Agricultural Society:

The exhibit at the last state fair in department K, of which I had charge, is well worthy of especial notice in one respect, at least, for it furnished us with overwhelming evidence of our inability to accommodate this great and interesting department of our state fair. Our present facilities are altogether inadequate to the occasion.

There was but very little on exhibition in the department which had a proper amount of space and opportunity given it. The one surprising feature of it was, the abounding good nature with which the exhibitors consented to crowd their exhibits and accept of unfavorable conditions with so little complaint.

It is very desirable to enlarge our facilities at as early a day as possible for it is doubtful if we can continue to hold our patrons so contentedly, unless we show clearly, on our part, a disposition to meet the growing wants of the department.

The sewing machine department attracted its full share of attention, and I found on the part of the agents of the leading manufacturers a willingness to contribute liberally towards the erection of a building adapted to their purposes entirely disconnected from the present hall if such location was deemed desirable.

The terms on which the proposition was based were, that the company so contributing should be entitled to the annual use of its assigned space for as many consecutive years as they continued to use it for exhibition purposes. The society to have the care and control of the building, and the disposal of the space when not used by the company.

If there could be sufficient raised in this way, or nearly enough to pay for the material needed, I think our society could well afford to erect the building.

Our society had called upon some of the representative

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citizens of Madison to make especial efforts to increase the exhibits in the art gallery. They responded so generously, that it soon became apparent that we would be overcrowded, so that it became necessary to request them to forbear, in order to give the limited space to exhibitors from other parts of the country. They acquiesced in this as cheerfully as they at first responded to the call for exhibits.

It would be impossible, within the proper limits of this report, to make particular mention of all the meritorious articles on exhibition, and to do less than this would be invidious. I will only mention that a valuable collection of seventeen (17) pictures from the pen of Mrs. E. Y. Richmond, of Appleton, failed to appear in our hall, because of the miscarriage of a letter which came to hand some weeks after the fair had closed.

There were in this department 618 entries. In 1883 there were but 324. The executive board offered premiums to the amount of $646.00, of which $476.00 were taken, leaving $170.00 of the amount offered still in the treasury.

Unless there should be a decline in the interest felt in this department, which we can hardly suppose possible, for everything points towards its increase, it will be impossible for us to give satisfaction at our next exhibition, should it be held in Madison, without enlarging our facilities.

The construction of a building for the sewing machines, as previously indicated, would probably be sufficient for the ensuing year, and possibly for a number of years to come.

All of which is respectfully submitted,

J. W. WOOD,
Superintendent.

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LIST OF OFFICERS OF AGRICULTURAL SOCIETIES FOR 1885, WITH THEIR P. O. ADDRESS AND PLACE AND DATE OF HOLDING FAIRS IN 1884.

COUNTIES.	Name of Society and Place and Date of Holding Fairs in 1884.	Name and P. O. Address of President.	Name and P. O. Address of Secretary.	Name and P. O Address of Treasurer.
Adams.....	Adams County Agricultural Society.....	H. A. Merriam.....	J. B. Keyes.....	A. T. Hill,
	Friendship, September 24, 25 and 26.....	Westfield.....	Friendship.....	Friendship.
Barron	Barron County Agricultural Society.....	W. W. Flinn	N. E. Carver	D. C. Strong,
	Chetek, Septemb r 15, 16, 17 and 18.....	Chetek.....	Chetek.....	Chetek.
Brown	Brown Horticultural and Agricultural Society	John M. Smith....	Werden Reynolds .	A. A. Warren,
	Depere, September, 2, 3, 4 and 5.....	Green Bay	Green Bay	Green Bay.
Buffalo	Buffalo County Agricultural Society.....	J. W. Whelan.....	J. W. DeGroff.....	F. H. Dillon,
	Mondovi, Oct. 2, 3 and 4.....	Alma	Alma	Alma.
Burnett.....	Burnett County Agricultural Society..	F. O. Olson	A. Gudmanson....	S. Thoreson,
	Grantsburg, September 24, 25, 26.....	Grantsburg	Grantsburg	Grantsburg.
Chippewa	Chippewa Coun y Agricul ural Society.....	J. W. Thomas.....	J. H. Murphy	Wm. B. Bartlett,
	Chippewa Falls, Sep ember 30–Oct. 1, 2 and 3	Cnippewa Falls..	Chippewa Falls..	Chippewa Falls.
Clark	Clark County Agricultural Soci ty.....	Geo. A. Austin	Fred Reitz	Jas. O'Neill,
	Neillsville, September 17, 18 and 19.....	Neillsville	Neillsville	Neillsville.
Columbia	Columbia County Agricultural Society.....	L. A. Squire.....	Kennedy Scott	John Foster,
	No fair on account of high water.....	Poynette.....	Rio	C lumbus.
Columbia ...	Lodi Union Agricultural Society.....	F. Perry	E. W. Gardner	Addison Eaton,
	Lodi, September 30–October 1, 2 and 3.....	Lodi	Lodi	Lodi.
Crawford	Crawford County Agricultural Society.....	Jas. Smethurst	A. B. Withee.....	Jas. Smith,
	Seneca, September 23, 24 and 25.....	Seneca	Seneca	Seneca.
Dodge	Dodge County Agricultural Society.....	M. Lovell	W. T. Rambush ...	G. R. Clapp,
	Juneau, Septem er, 16, 17 and 18.....	Juneau	Juneau	Juneau.
Fond du Lac .	Fond du Lac Co. Agricultural and Mech. Associat'n	H. D. Hitt.....	G. A. Lewis	Geo. Keyes,
	Fond du Lac, September 23, 24 and 25.....	Oakfield	Fond du Lac....	Empire.
Fond du Lac .	Ripon Agricultural Society	G. Dobbs..	T. D. Stone	P. K. Pickard,
		Ripon.....	Ripon	Ripon.
Grant.....	Grant County Agricultural Society.....	J. J. McKenzie	John P. Lewis.....	W. J. McCoy,
	Lancaster, September 24, 25 and 26	Lancaster.....	Lancaster	Lancaster .....

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LIST OF OFFICERS OF AGRICULTURAL SOCIETIES FOR 1884—Continued.

COUNTIES.	Name of Society and Place and Date of Holding Fairs in 1884.	Name and P. O. Address of President.	Name and P. O. Address of Secretary.	Name and P. O. Address of Treasurer.
Grant.....	Boscobel Agr. and Driving Park Association..... Boscobel, Sept. 30–October 1, 2, 3..	G. F. Hildebrand.. Boscobel.	T. J. Brooks..... Boscobel	C. McWilliams, Boscobel.
Green.....	Green County Agr. and Mech. Institute..... Monroe, September 10, 11, 12, 13.....	Henry Thorp..... Monroe	A. L. Lichtenwalmer Monroe.....	H. G. Cleveland, Monroe.
Iowa.....	Iowa County Agricultural Society..... Dodgeville, September 23, 24, 25, 26.....	Joel Whitman..... Dodgeville.....	Benj. Thomas, Jr.. Dodgeville..	J. P. Smelker, Dodgeville.
Iowa.....	Southwestern Wiconsin Industrial Association..... Mineral Point, September 2, 3, 4, 5.....	Geo. G. Cox..... Mineral Point...	D. P. Beech..... Mineral Point...	Thomas Priestly, Mineral Poin .
Jackson.....	Jackson County Agri. and Hort. Society..... Black River Falls, Sept. 25, 26, 27.....	M. Douglas..... Melrose.....	H. H. Price..... Blk. River Falls.	W. R. O'Hearn, Black Riv. Falls
Jefferson.....	Jefferson County Agricultural Society..... Jefferson, September 9, 10, 11, 12.....	Geo. C. Mansfield.. Johnson's Creek.	S. N. D. Smith..... Harvey	Geo. Copeland, Jefferson.
Jefferson.....	Central Wis. Agri. and Mech. Association..... Watertown, September 22, 23, 24, 25, 26.....	S. G. Roper..... Watertown	S. M. Eaton..... Watertown	James Salick, Watertown.
Juneau.....	Juneau County Agricultural Society..... Mauston, October 1, 2, 3, 4.....	C. W. Potter ..... Mauston.....	J. C. Wetherby.... Mauston.....	F. Winsor. Mauston.
Kenosha.....	Kenosha County Agricultural Society..... Kenosha, September 9, 10, 11, 12.....	C. A. Dewey .. .. Kenosha	D. A. Mahoney .... Kenosha.....	G. H. Marr, Kenosha.
La Crosse....	La Crosse County Agricultural Society..... .... West Salem, September 23, 24, 25..	F. B. Smith ..... Salem.....	A. J. Philips..... West Salem.....	William Smith, Bangor.
La Fayette...	La Fayette County Agricultural Society..... Darlington, September 23, 24, 25, 26.....	H. Campbell..... Darlington	O. F. Blakely..... Darlington.....	A. Richardson, Darlington.
Manitowoc...	Manitowoc County Agricultural Society..... Manitowoc, September 30–October 1, 2, 3, 4....	I. Clark ..... Clark's Mills.....	Thos. Gleeson..... Clark's Mills	T. Osulson, Oslo.
Manitowoc...	Manitowoc Indust. and Mech. Association.....	Fred Schmitt..... Manitowoc	N. A. Walker..... Manitowoc.....	Thomas Torrison, Manitowoc.
Marathon....	Marathon County Agricultural Society..... Marathon, October 24, 25, 26.	A. F. Marquardt... Wausau.....	Wm. Wilson..... Wausau.....	A. Kickbusch, Wausau.

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LIST OF OFFICERS OF AGRICULTURAL SOCIETIES FOR 1885—Continued.

Counties.	Name of Society, and Place and Date of Holding Fairs in 1884.	Name and P. O. Address of President.	Name and P. O. Address of Secretary.	Name and P. O. Address of Treasurer.
Marquette....	Marquette County Agricultural Society..... Westfield, October 1, 2.....	S. Tanner ..... Westfield	W. W. Page..... Douglas Center.	John Ellis, Moundsville.
Monroe	Monroe County Agricultural Society..... .... Sparta, October 1, 2, 3, 4	A. H. Isham ..... Sparta	Wm. H. Blyton ... Sparta	Ira A. Hill, Sparta.
Monroe	Eastern Monroe County Agricultural Society..... Monroe, September 17, 18, 19.....	H. Doxtrader ..... Tomah.....	E. L. Bolton ..... Tomah.....	Wm. Randall,
Outagamie...	Outagamie County Agricultural Society ..... Outagamie, September 17, 18, 19	John Dey ..... Greenville	F. W. Harriman... Appleton.....	M. McCorub, Hortonville.
Ozaukee	Ozaukee County Agricultural Society... ..... Saukville, September 24, 25	A. M. Alling ..... Saukville	L. C. Larson ..... Pt. Washington	Lorens Seiberlich, Saukville.
Pepin	Pepin County Agricultural Society..... Durand, September 10, 11, 12.....	S. L. Plummer .... Arkansaw.....	M. Knight ..... Durand	Geo. Tarrant, Durand.
Pierce.....	Pierce County Agricultural Society..... ..... Prescott, September 18, 19	J. S. Copley..... Prescott.....	D. J. Dill..... Prescott	F. J. Atwater, Prescott.
Pierce.....	Pierce County Central Fair and Stock Exchange ... Ellsworth, September 24, 25, 26.....	D. W. Woodworth. Ellsworth	J. C. Denneston ... Ellsworth	Louis Huber, Ellsworth.
Portage	Portage County Agricultural Society .... Amherst, September 23, 24, 25	Edwin Turner..... Amherst	A. J. Smith ..... Amherst	A. M. Nelson, Amherst.
Racine	Racine County Agricultural Society..... Burlington, September 9, 10 11, 12.....	A. J. Hannas.... . Burlington.....	C. A. Jones..... Burlington.....	Thos. Marsland, Burlington.
Richland.....	Richland County Agricultural Society ..... Richland Center, September 24, 25, 26	J. L. K. McCollum. Twin Bluffs....	C. A. Hatch ..... Ithaca	W. H. Pier, Richland Center
Rock.....	Rock County Agricultural Society ..... Janesville, September 30, October 1, 2, 3.....	R. T. Pember..... Johnstown C'n'r	W. T. Van Kirk ... Janesville.....	E. B. Heimstreet, Janesville.
St. Croix.....	St. Croix County Agricultural Society .... Hudson, September 17, 18, 19	W. H. McDinriud . Hudson	Theo. F. Young ... Hudson	J. A. Bunker, Hudson.
Sauk.....	Sauk County Agricultural Society ..... Baraboo, September 24, 25, 26.....	John M. True ..... Baraboo	A. D. McGilvra.... Baraboo	G. C. Grisim, Prairie du Sac.

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LIST OF OFFICERS OF AGRICULTURAL SOCIETIES FOR 1885—Continued.

COUNTIES.	Name of Society, and Place and Date of Holding Fairs in 1884.	Name and P. O. Address of President.	Name and P. O. Address of Secretary.	Name and P. O. Address of Treasurer.
Sauk	Baraboo Valley Agricultural Society Reedsburg, October 8, 9, 10	Jas. Lake Reedsburg	A. F. Lawton Reedsburg	A. P. Ellinwood, Reedsburg.
Shawano	Shawano County Agricultural Society Shawano, September 16, 17, 18, 19	A. Koeppen Shawano	D. A. McDowell Shawano	John Klickman, Belle Plain.
Sheboygan	Sheboygan County Agricultural Society Sheboygan Falls, September 10, 11, 12	H. K. Looms. Sheboygan Falls.	E. Clark Sheboygan Falls.	J. C. Fairweather, Sheboygan Falls.
Taylor	Taylor County Agricultural Society Medford, October 14, 15, 16	C. C. Palmer Medford	A. J. Perkins Medford	J. H. Wheelock, Medford.
Trempealeau	Trempealeau County Agricultural Society Trempealeau, September 23, 24, 25	F. H. Kribs Trempealeau	L. L. Odell Galesville	E. F. Clark, Galesville.
Vernon	Vernon County Agricultural Society Viroqua, September 24, 25, 26	F. K. Van Wagoner Viroqua	O. B. Wyman Viroqua	E. Powell, Viroqua.
Walworth	Walworth County Agricultural Society Elkhorn, September 23, 24, 25, 26	Wm. Blakeley Darien	Levi E. Allen Elkhorn	W. D. Lyon, Elkhorn.
Washington	Washington County Agricultural Society West Bend, October 1, 2, 3, 4	W. P. Rix West Bend	Jos. Ott West Bend	Geo. W. Jones, West Bend.
Waukesha	Waukesha County Agricultural Society Waukesha, Sept. 30–Oct. 1, 2, 3, 4	Martin Field Waukesha	Geo. B. Blair Waukesha	S. A. Fox, Waukesha.
Waupaca	Waupaca County Agricultural Society Weyauwega, September 23, 24, 25	W. W. Crane Evanswood	J. D. Puffer Weyauwega	Wm. Wood, Weyauwega.
Waushara	Waushara County Agricultural Society Wautoma, Sept. 30–Oct. 1, 2	J. S. Bugh Wautoma	J. T. Ellarson Wautoma	Gilbert Tennant, Wautoma.
Wood	Wood County Agricultural and Mechanical Ass'n Grand Rapids, September 16, 17, 18, 19	G. J. Jackson Grand Rapids	F. L. Tibbits Grand Rapids	W. T. Jones. Centralia.

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MINUTES

OF THE

STATE AGRICULTURAL SOCIETY.

STATE AGRICULTURAL ROOMS.

In accordance with the requirements of the constitution, the life members of the Wisconsin State Agricultural Society convened at the Agricultural Rooms, on the evening of September 18, 1884.

Pursuant to notice, Hon. N. D. Fratt, on taking the chair, called the meeting to order.

The rooms of the society being too small for the accommodation of the members, they adjourned to the assembly chamber, where the regular business of the society was taken up.

The first business in order was the election of officers for the ensuing year.

Messrs. Hitt and Eaton were appointed tellers.

Hon. N. D. Fratt, who had been president for so many years, positively and peremptorily refused to be a candidate for re-election.

An informal ballot for the office resulted as follows:

A. A. Arnold, Trempealeau	58
John L. Mitchell, Milwaukee	28
J. M. Smith, Green Bay	10
N. D. Fratt, Racine	12
J. W. Wood, Baraboo	5
Matt. Anderson, Cross Plains	1
Blank	2

On motion of J. C. Ford, the ballot was declared formal, and the election of Mr. Arnold was made unanimous.

The next business in order was the election of the secretary.

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Hon. A. B. Braley moved that in voting for this office the members rise, announce their names and deposit a ballot in the hat of the teller.

Whole number of votes cast, 107.

Col. Vilas	1
W. H. Morrison	10
Clinton Babbitt	96

On motion, the ballot was declared formal, and the election of Mr. Babbitt unanimous.

On motion of Mr. Vilas, the secretary was instructed to cast the vote of the society for Cyrus Miner for treasurer.

The ballot was cast and Cyrus Miner was declared unanimously elected treasurer for the ensuing year.

On motion of E. W. Keyes, a committee consisting of one from each congressional district was appointed to select the remaining officers, namely, vice-presidents and additional members of the executive board.

The committee reported the following names as vice-presidents:

1st District — B. L. Martin, Janesville.
2d District — H. D. Hitt, Oakfield.
3d District — Mat. Anderson, Cross Plains.
4th District — John L. Mitchell, Milwaukee.
5th District — J. M. Smith, Green Bay.
6th District — A. W. Vaughn, Lodi.
7th District — J. W. Wood, Baraboo.
8th District — W. A. Johnston, Galesville.
9th District — Isaac Stephenson, Marinette.

Additional members: Orris Pratt, Spring Prairie; Wm. Jacobs, Madison; T. L. Newton, Beaver Dam; F. C. Curtis, Rocky Run; D. T. Pilgrim, West Granville; Geo. B. Shaw, Eau Claire; A. Ludlow, Monroe.

Hon. A. A. Arnold offered the following resolution, which was unanimously adopted:

Resolved, Now on the retirement of Hon. N. D. Fratt as President of this Society, having served as such for seven years, and having been for twenty-one years an active member, it is the sentiment of the members of this Society, that he has at all times deported himself as a gentleman, active and efficient.

And has at no time in his official capacity manipulated any polititcal

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partisanship and has done all in his power to make our society useful to the commonwealth.

Hon. E. D. Holton, U. S. Commissioner to represent Wisconsin in the World's Exposition at New Orleans, offered the following resolution:

Resolved, That it is the sentiment of the members of the Wisconsin State Agricultural Society, that if the commissioners of the World's Exposition at New Orleans can borrow a sum of money not exceeding $20,000 for the promotion of a suitable exhibit for Wisconsin, that the same should be reimbursed from the Treasury of the State.

After some discussion the resolution was declared by the president as passed.

Hon. E. D. Holton moved that the resolution be passed unanimously in order to carry weight and force, by the action of this society.

No one voting in the negative, it was so announced by the chair.

Prof. W. W. Daniels offered the following resolution which on motion was tabled.

Resolved, That the officers of this society be requested to exclude from the exhibition grounds of the society, all gambling games and games of chance.

The following resolution offered by Geo. J. Kellogg, was tabled.

Resolved, That the members of the Agricultural Society of Wisconsin, do hereby instruct its executive board to bar and forbid the sale of all intoxicating drinks or liquors during its annual fair.

On motion the meeting adjourned.

EXECUTIVE BOARD MEETING.

MADISON, WIS., Sept. 19, 1885.

Meeting called to order by President Fratt.

The following protest was submitted to the Board:

"Protest of Galbraith Bros. against decision for Gold Medal in class for Sweepstakes Stallion, on the ground that the referee was an interested party, an exhibitor in same class, and the decision was given from motives of jealousy and unfriendliness toward us.

GALBRAITH BROS."

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To the Executive Board of the Wisconsin State Agricultural Society:

I do hereby protest against the action of the committee in passing on Sweepestakes Stallion of any age or breed, showing for the Gold Medal and Diploma and respectfully petition of your Board to set aside their decision and have them passed on again by another committee.

W. D. CROCKETT.

Mr. Wood moved that the protest be sustained, which was carried.

Moved by Mr. Arnold that the exhibitors in that class agree on one man, for the decision; if they cannot agree on one man that each of the exhibitors appoint a man to decide.

Carried.

Adjourned.

AGRICULTURAL ROOMS,
MADISON, WIS., Feb. 2, 1885.

In accordance with the by-laws, the Executive Board met in the rooms of the Society at 7.30 P. M.

Present—Messrs. Arnold, Fratt, Martin, Hitt, Smith, Wood, Johnston, Miner, Pratt, Newton, Curtis, Pilgrim and Babbitt.

President A. A. Arnold in the chair, after calling the meeting to order thus addressed the board:

Gentlemen, Members of the Executive Board:

This is the first time I have appeared before you in the official capacity of President of the Wisconsin State Agricultural Society, and the first opportunity I have had to express my thanks for the honor the members of this society saw fit to confer on me by making me their president.

Allow me to here say that I highly esteem the confidence thus manifested, and to say that it shall ever be my utmost desire to promote the best interests of the society, and to which I pledge my best endeavors.

Many of you are my seniors, not only in years but in membership in this organization therefore will be able to give much wholesome council, which I here now, and for

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the future invoke. This society is for the benefit of the people of this commonwealth.

In this view we are all alike equally interested. In this body each has an independent voice and vote on all questions that arise, when each counts just one and no more in determining the action of this body on any question that may come up for consideration and determination. Here, as in most societies in America, the majority rules, and it is the duty of the minority to cordially acquiesce in any measure that seems most desirable to the majority.

In our former deliberations under the happy leadership of our esteemed late president, Mr. Fratt, this has maintained in the main, and I bespeak the same for the future.

I would recommend a thorough investigation of the financial affairs of the society so that each one of us may have an intelligent understanding of the receipts and expenditures of the society, and its present financial standing. A thorough overhauling of the premium list, and some arrangement whereby presidents of county agricultural societies may be called upon to act as judges at our fairs, thus insuring a competent corps to select from to award premiums.

That in choosing superintendents for the different departments, we select those best fitted for the respective departments, regardless of previous positions.

That in the stock departments we have distinct premiums on stock bred and owned in our own state, as distinguished from those reared and owned in other parts; that economy be pursued in all our expenditures, but not such as to dwarf into parsimony, and that the premium list be as liberal as the state of our finances, and the probable receipts will warrant.

That we introduce some novel features in our annual fair, not derogatory to the morals of the community, so as to make it more attractive and thereby increase our revenues.

These fairs are educators and all legitimate inducements compatible with their design should be held out by way of getting people where they will get the benefits of the organization. Some of you have, no doubt, other points of

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improvement to suggest, and I hope we will devote plenty of time to the consideration of any innovation, that we may make no mistake in adopting any thing before its season, and neglect nothing available that will tend to make an annual fair and the State Agricultural Society in every department a success.

Prof. Bascom and Mr. Olin were present and requested the board to receive committees from W. C. T. U. and Methodist conference.

On motion of Prof. Wood, it was decided to receive committee at 3 P. M., Tuesday.

The minutes of last meeting were read by the secretary and approved.

Treasurer Miner read his report for fiscal year ending December 6, 1884.

Reading of reports by superintendents of departments.

Superintendents for 1885 were elected as follows:

Department A — Horses — T. L. Newton, Beaver Dam.

Department B — Cattle — W. A. Johnston, Galesville.

Department C — Sheep — Orris Pratt, Spring Prairie.

Department D — Swine — F. C. Curtis, Rocky Run.

Department E — Poultry — Wm. Jacobs, Madison.

Department F — Agriculture — C. L. Martin, Janesville.

Department G — Fruits and Flowers — J. M. Smith, Green Bay.

Department H — Machinery — A. W. Vaughn, Lodi.

Department I — Manufactures — H. D. Hitt, Oakfield.

Department K — Fine Arts — J. W. Wood, Baraboo.

Superintendent of Gates — N. D. Fratt, Racine.

Marshal — Matt Anderson, Pine Bluff.

Superintendent of Forage — D. T. Pilgrim, West Granville.

On motion of Mr. Newton, the following was made one of the rules of entry:

"Fees for stalls must be paid to the superintendent of the horse department at the time that application is made for the same."

On motion of Mr. Fratt, the name of C. M. Clark, White-

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water, Wis., was substituted for that of D. C. Lamb, in the 3d rule of entries.

On motion of Mr. Arnold, rule 3, general rules, was amended, by adding thereto: "Any animal or article exhibited in a class where there is no competition may be awarded a second or third premium if the committee deem it not worthy of a first."

It was also resolved that in all departments of stock, exhibits for a cash premium shall be confined to Wisconsin, and that diplomas and other commendations may be given to exhibitors from abroad.

Messrs. Bryant, Kiser and Clark were appointed a committee to revise list for Department B.

Sweepstakes in that department were withdrawn and on motion of Mr. Arnold, the following offered for

FAT CATTLE.

Not less than 5 head	$50 00
Second best	30 00
Best single head	10 00
Second best	5 00

On motion of Mr. Hitt, "No awards are to be made in silver plate but in its stead 50 per cent. in cash."

On motion of Mr. Johnston, $20 premium was to be offered for a bushel of corn in the ear. Any variety.

Committee on Department B. reported no changes with the exception of confining exhibits to Wisconsin.

On motion, the measure of grains in class 26 was changed to one bushel of corn; other grains 10 quarts in patent pail.

Wording of premiums on dairy butter to be changed to correspond with that of creamery butter.

The heading of Class 50 was made to read "No competition will be allowed and no premium awarded in this class."

The following changes in classes 51 and 52 were made without adding to amount offered.

Best Kensington painting	$3 00
Best Chenielle embroidery	2 00
Best fire screen	2 00
Best pin cushion	1 00

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Best ladies work box	1 00
Best set embroidered underclothes, hand made	2 00
Best set embroidered underclothes machine made	2 00
Home-made linen articles	3 00
Woolen mittens	2 00
Silk mittens	2 00
Hand knit or crocheted skirt	4 00
Lady's dress made by professional dressmaker	4 00
Lady's dress made by other than professional dressmaker	4 00
Drawn rug	2 00
Silk rug	2 00
Braided rug	2 00

Class 49 was changed on motion of Mr. Hitt, so that awards will be $2.00 and diploma.

On motion of Mr. Johnston the president was instructed to maintain rule of last year forbidding gambling on the fair grounds.

On motion of Mr. Wood, the resolution prohibiting gambling and sale of ardent spirits on the fair grounds was ordered printed in the premium list.

TUESDAY, February 3, 1885.

President Fratt in the chair.

Protests taken up.

In Class 5—Matched Horses and Mares—after taking testimony in the matter of protested premiums between E. Bullard and R. Boyce and Ove Johnson and Robert Caldwell, it was resolved to divide the premium between the four parties claiming the same, giving to each a blue ribbon. The ayes and noes were:

Ayes—Arnold, Hitt, Johnston, Pilgrim, Newton.

Noes—Fratt, Martin, Babbitt, Miner.

Messrs. Bullard and Johnson refusing to accept half the amount of premium, were awarded full premium, and Messrs. Boyce and Caldwell half premium.

In the matter of V. G. Druse's claim for return of entry fee of $25.00, the board instructed the secretary to investigate the matter, and if in his judgment Mr. Druse's claim was just, to pay the money.

The secretary was also instructed to confer with Mr. Dous-

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man to whom the Superintendent of the Horse Department gave the gold medal awarded on second inspection to Galbraith Bros., and if Mr. Dousman returned it, to give the same to Messrs. Galbraith.

Special premiums were awarded as follows:

Rueben Boyce, $5.00 for yearling colt; Louis Pammel $5.00 parasitic fungi.

The final revision of premium list was left to Messrs. Newton, Arnold and Babbitt.

Letters from Messrs. Anderson & Findlay and the National Cattle Grower's Association were laid upon the table to await further consideration.

Resolution indorsing N. J. Colman for Commissioner of Agriculture, was unanimously passed.

The time and place of holding the State Fair for 1885, was on resolution decided to be from September 7th to 11th inclusive, at Madison, Wisconsin.

WEDNESDAY, Feb. 4, 1885, 8:30 A. M.

Board called to order, President Arnold in the chair.

Mr. Wood introduced the following resolution:

Resolved, That the sale of intoxicating liquors, including beer, be excluded from the State Fair Grounds during the annual exhibition of the Society.

Carried.

Ayes — Messrs. Arnold, Fratt, Martin, Hitt, Smith, Vaughn, Wood, Johnston, Miner, Newton, Curtis and Pilgrim.

Noes — Mr. Babbitt.

Secretary Babbitt explained his position in the question in the following words:

I voted "no" on the grounds that I consider this question has assumed a political character in the state, and inasmuch as this organization has been kept free from politics and everything connected with it, I shall on that ground vote "no;" but I will say this much in deference to all these gentlemen who voted in the affirmative, that I will do everything in my power to enforce this law. I must say that I believe this society has arrived at a crisis, and I believe that it is the duty of these ladies and gentlemen who have come

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here and made such excellent speeches in behalf of this so-called reform, to go before the legislature of the state of Wisconsin and see that an appropriation is made which shall enable the Wisconsin State Agricultural Society to maintain the proud position already won. Now, gentlemen, you are in duty bound to do this. I feel that the action of this board has laid it under criticism from the powers that be and that control the state of Wisconsin. I feel that there may be an excuse offered in the legislative halls that you have voted against the sentiment of the people of the state, and I very much fear that an appropriation, without your strenuous efforts, will be lost, and that the Wisconsin State Agricultural Society will be ranked among the things that were.

Now, gentlemen, I only speak of this to urge upon you, if you love agriculture, and the state, God and home and native land, to stand by the Wisconsin State Agricultural Society and see that its banner never trails in the dust, and that it shall have the sanction and support of all good and true men of all parties, all creeds, all sects, and all opinions. I must say before I sit down that I dislike this boycotting business exceedingly, and the statement made by one distinguished speaker on this floor, in the presence of this intelligent assembly, that gambling was permitted last season on the grounds, is not warranted by the facts. Last season we refused an offer of $800 for the wheel privilege.

A more orderly assembly of thirty thousand people never gathered in the state than the one in attendance upon the last state fair. Possibly these gentlemen know much more than I do about running the Agricultural Society. It is more than probable, but I know this society will fail, ignobly fail, unless you put your shoulders to the wheel, and stand by its appropriation. The governor of the state of Wisconsin saw fit not to even mention the Wisconsin State Agricultural Society in his message. He recommended, also, that an Agricultural Board be established, which in the end would supersede this society.

I feel that we ought not to be boycotted, ought not to be set upon, ought not to be put in the dust for the *great work*

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that has been done. Throughout the nation from one end of the country to the other, this society ranks with any society in agricultural importance, and it is with the greatest pleasure that I can say that the Agricultural Society of the State of Wisconsin is pointed to as one of the grandest institutions in this land. It is in fact the farmers' proudest and noblest monument.

On motion of Secretary Babbitt, Dr. A. C. Barry was made an honorary member of the Board.

Board adjourned.

SPECIAL MEETING.

AGRICULTURAL ROOMS, MONDAY EVENING, February 23.

Meeting called to order; ex-President Fratt in the chair. Present, Messrs. Martin, Ludlow, Curtis, Vaughn, Smith, Newton, Fratt and Babbitt.

The call for the meeting being explained to be the consideration of bill No. 501.

Secretary Babbit read letters from absent members of the board on bill No. 501, and article on said bill from "Milwaukee Journal."

Messrs. Martin and Fratt spoke against the bill.

Mr. Smith thought the bill crude, should not like to have it pass in its present form, would suggest changes, and had no doubt they would be made. Inspected Estabrook's bill before its passage, recommended some changes in bill, and also to have it take effect immediately, on account of farmers' conventions and institutes; the bill was subsequently passed under suspension of rules by the legislature.

Mr. Fratt — Mr. Smith, with an amendment or two, would you favor this bill?

Mr. Smith — Would not say that to-night.

Mr. Newton — What benefit could the people of Wisconsin receive from two societies that they could not receive from ours?

Mr. Ludlow spoke against passage of the bill.

Mr. Newton moved that a committee of three be appointed

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by the chair to draft a resolution expressing the opinion of the executive board on bill 501.

Motion passed, and Messrs. Newton, Ludlow and Martin were appointed such committee.

On motion, board adjourned.

TUESDAY MORNING, February 24.

Meeting called to order, Mr. Fratt in the chair.

Mr. Newton chairman of Committee on Resolution read the following Memorial of the Wisconsin State Agricultural Society, taking action against the passage of assembly bill 501.

TO THE HONORABLE THE LEGISLATURE OF WISCONSIN:

The members of the Executive Board of the Wisconsin State Agricultural Society, having had their attention called to assembly bill No. 501, and having carefully considered the same, deem it their duty, as the representatives of a society consisting of nearly eight hundred life members, and of representative members from all the County Agricultural Societies of the state, to protest against the passage of the same.

The State Agricultural Society has grown up from a small society to a large one, through the unpaid and disinterested efforts of the most enterprising farmers of the state, until it now exerts a wide and beneficial influence upon the agricultural, manufacturing and mechanical interests of the state.

We greatly fear that the assumption of the control of this society, by the state taking the appointment of its officers and managers out of the control of the members who have built up the society, making such officers and managers responsible alone to the governor who appointed them, giving them pay for services which have heretofore been gratuitously rendered by some of the most intelligent men in the state, will tend to greatly lessen the usefulness of the society, if not to destroy it. Besides, we deem it unwise, if not dangerous to the public interest, to thus thrust an entering wedge into the state treasury in the way of paying for ser-

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vices, which is very likely to make a rent through which, in the future, very considerable sums of money will flow.

As the society is now performing its work well and is in a prosperous and growing condition, we can conceive of no proper reason for any member of the legislature voting for said bill.

We therefore, in the interest of the agricultural, manufacturing and mechanical industries of the state, and especially in the interests of public economy, respectfully protest against the passage of said bill, and ask the members of the legislature to vote against it.

T. L. NEWTON,	N. D. FRATT,
H. D. HITT,	A. LUDLOW,
J. W. WOOD,	C. LOFTUS MARTIN,
CYRUS MINER,	F. C. CURTIS,
D. T. PILGRIM,	A. W. VAUGHN,
WM. JACOBS,	CLINTON BABBITT,
	Memorial Committee.

The secretary was by resolution requested to present the above memorial to both houses of the Wisconsin legislature.

The board adjourned.

TUESDAY, February 3, 3 P. M.

The President—The time has arrived when we were to listen to representatives from various societies that desire to present the question of allowing the sale of beer on the fair grounds. I will state, before these gentlemen and ladies commence, that we have decided that we will not allow gambling of any kind on the fair grounds, that they may not say any thing about that question in their arguments.

Secretary Babbitt presented a resolution from the horticultural society protesting against the sale of intoxicating liquors on the fair grounds.

Secretary Babbitt—I want to say here, and probably it is all I will have to say on the question, that it was unanimously decided last year not to allow any gambling upon the fair grounds, and there was none allowed. It might have been started, but the officers were commanded at once

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to arrest any man that attempted to gamble on the fair grounds last season. In a community a man might have his pocket picked, and there is a law against it, and so there is against gambling. If there was any, it was summarily stopped.

Mr. J. M. Smith — I want to say that in the resolution there was no thought of casting any blame on the society for what was done last year. Our society simply wished you to continue in well doing. I think the members of our society understand that there was no gambling allowed last year.

Mrs. J. M. Olin, Madison — In the name of the Woman's Christian Temperance Union, I thank you for the courtesy you show in allowing us to interrupt your regular order of business to present our petition.

(Resolution of Woman's Christian Temperance Union read.)

This is signed by the officers of the state union and many members of both the state and local unions. There was another resolution passed at the same convention, which it was not at first my purpose to read, but upon hearing that our action, one year ago, in appearing here, was misinterpreted, and it was said that perhaps we were looking out for admission tickets and favors of that nature, I think perhaps it is proper to read this other resolution.

(Resolution not to attend any state fairs where gambling and intoxicating liquors are not excluded read.)

This was not passed for the purpose of presenting it to you, or calling your attention to it. I should not have mentioned it, if it had not been for this fact. We know that, as a distinctively temperance organization, we do not stand upon the same ground with you in considering the question of the sale of intoxicants.

Our main purpose is, to you, one of many secondary considerations; but we know there is no one of you who does not believe it to be an important consideration. In bringing before you the question of the sale of intoxicants on the ground of the state fair, we desire to leave our own ground and come upon yours. We wish to put out of sight

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entirely our purpose as an organization, and consider the subject solely with respect to the purpose of your organization. We wish, in doing this, to be sure that we are putting ourselves in range with your real purpose. This we can not admit to be the financial success of the annual fair. Such success, though very important, is certainly one of the secondary purposes of your organization, and such a fair should be managed, not only with respect to its own interest, but with respect to its effect upon the general interests of the state.

We believe you will admit that it would be very possible to have a fair which would call together many hundreds of people, and leave a handsome amount of money in the treasury, and still, so far as it affects the interests of the state, be a great failure. And, if that is true, we are quite justified, it seems to us, in refusing to admit the justice of the argument that you cannot make a fair pay without allowing the sale of intoxicants upon its grounds. We believe we are even justified in declaring that whether a fair pays its own expenses or not is comparatively of little importance, so long as it serves the real purpose for which it was intended, and promotes the interests of the state. The state, in making grants of public money, declares that your society is not supposed to be self-supporting, and removes all excuse and justification for resorting to any means, merely for the sake of raising money, that will tend in any degree to injure the best interests of industry and sobriety. While asking you, then, to keep in view your main purpose as an organization, we are very willing to consider any secondary objects, and, among these, the financial success of the annual exhibition or fair, but we think that that success need not necessarily be sacrificed by excluding from your grounds the sale of intoxicants. At least twenty-six county agricultural societies prohibit the sale of intoxicants upon their grounds, and we think the board of the State Agricultural Society has as able financiers as the boards of our county agricultural societies, and these societies report to us that their action in this regard is not attended with any financial loss.

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We believe that the average public sentiment of the state is very strongly opposed to the sale of intoxicants upon the grounds of all agricultural fairs, and that this is true even among our foreign population, or those of that class who are not engaged in selling intoxicants, or who do not use them to the excess of occasional drunkenness, but when we come to the class of men who are especially interested in the success of your annual exhibitions, and do more to insure their success than any other class, the farmers and manufacturers of the state, we find the proportion of those who are opposed to the course pursued last September, and usually pursued, to be surprisingly increased. We always believed that a large majority of this class were with us in this matter, but we had no means of knowledge in it until last fall. On the last afternoon of the recent state fair an opportunity was given to such exhibitors as could be found on the grounds to express an opinion in the matter, and the results surprised us very greatly. Of 95 exhibitors who could be found on the grounds, 91 seized the opportunity gladly of expressing themselves as follows:

(Resolution of exhibitors read.)

These names were procured in about two hours and a half on the grounds, and it will readily be seen that this expression is not the result of any persuasion or solicitation. Each exhibitor was given the opportunity of signing his name and that is all, and it was almost the unanimous expression of opinion, from people who had property on the ground, and were obliged to remain with it until late in the evening, or sometimes during the night; and I am sorry to say that many of those men had suffered personal loss and inconvenience from drunkenness on the ground.

We believe our petition only asks you to take a ground in harmony with the public sentiment of the state, and that you can do this without any financial loss, and that it asks you to heed the earnest wish of the class most interested in your exhibitions; and, although we believe it can be done without any financial loss, we most always insist that whether it can be or not is a matter of little importance, as long as you depend upon state money and are not supposed

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to be a self-supporting organization, and so long as your annual fairs tend to promote the real interest of the organization and advance the interests of the state. There is but one more consideration which, as women, we can not pass by without a word. In the name of the industrial prosperity of the state; in the name of our common interests and the safety of our homes; we must make a plea for our children. The children of the state were invited to attend the last fair without money and without price, and they came in troops. Many came without their parents. Many came from a distance who had been looking forward to that occasion, and a saloon keeper stood outside of the fair grounds saying "come on, boys, and take a drink; fair time comes but once a year." I heard him giving this invitation, sitting in pavilion hall, and I saw him selling to hundreds of boys, in direct violation of law, and in the sight of hundreds of citizens, who knew that the law was utterly powerless, and that nothing could be done to punish the violators.

But it was not the actual drinking of liquor by children on the fair grounds, or other intoxication, that I intended to speak of. It was the influence on the minds of the children who came in sight of these saloons and those in their vicinity. We are to apt to forget the effect of such things upon the minds of children, and we who live in cities are apt to forget the fact that a majority of the children on our farms and in our villages are brought up to regard the saloon as a dangerous institution and as a disreputable place, and it is a good thing for them and the state that they do so regard it. I know a widowed mother who could not induce her 16 year old son to enter a saloon to see a man, to deliver a message. "Mother," he said, "you can not see him to-day; he is in a saloon." "But did you tell him I must see him?" she asked. "Why, no; of course I would not go into a saloon," and although the business was so urgent that, if she had not been too much of an invalid to leave her carriage, she would have gone herself, she could not induce her boy to enter the saloon. He refused simply on the ground of the general bad character of such places, and this was a very respectable saloon, so far as such places go. This wo-

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man returned home feeling that her education of her boy was in one sense easy. This fairly represents the sentiment of a large portion of the people of our state who, though they are not themselves pledged to temperance, look upon any tippling place as an unmitigated evil; but when children come from such families to an agricultural exhibition where ten or a dozen open bars occupy a prominent place on the ground, we believe it a wrong step in their education. It teaches that representative men, men who are working to advance the most important interests, think best to really convert a large portion of their grounds into a saloon.

Some of the states make it a crime for the proprietors of a saloon to admit children upon premises that are so employed, and we believe it is universally admitted that the mere sight of the drinking and carousing in such places is demoralizing to children. When open bars are placed upon the grounds of the agricultural society, such influences are felt so far as the drinking and disorderliness about such places are visible, and the space all about is practically converted into a saloon, and the class accustomed to indulgence is injured less than the other class, which, brought within the radius of evil influences, suffers from the first indulgence; and the injury to both these classes does not exceed the injury to that far greater class, who, while they may not suffer from personal indulgence, must lose in moral tone from familiarity with evil. Do not teach our boys that to stumble over a drunken man in such a place is nothing, that the folly and rudeness and the imbecility incident to different stages of intoxication are nothing that any one need concern themselves about. The actual drunkenness created by open bars in such places may ruin individuals, but the influence of such a place may demoralize a nation. We ask you to protect our state and our nation from such a demoralizing influence.

Mrs. Bascom — *Mr. President and members of the state board of agriculture:* Doubtless you are weary of seeing us come up before your meeting, and it is growing monotonous to ourselves, but our cause is so just and so important, that we must continue to come until our request is granted from

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our very importunity, if we fail to reach your moral sense. We must come as members of the Woman's Christian Temperance Union, which has for its object the utter extinction of the beer and liquor traffic. It is our first and special obligation to banish this traffic from our state fair grounds, where the conditions are such that its power to do harm is increased ten fold. We must come, too, in behalf of womanhood, in behalf of the wives and mothers, who have no representative on your board, who bear a large part of the toils and privations incident to farm life; who have so often to bear innocently and helplessly those untold miseries that follow in the wake of the drinking habit of our men. We must come too as citizens, equal participants with yourselves in the weal and woe of our commonwealth. But how strange it is that we must needs come before the members of a society expressly organized to promote agriculture and the mechanical and industrial arts of our state; that we should have to come to plead, before the members of such a society, that they withhold their influence, their encouragement and their financial support from the liquor traffic; the liquor traffic that injures the industrial interests of our state more than all other evils combined, which is a greater obstacle to the promotion, this day, of the agricultural interest and the other interests of our state than all the other obstacles combined. How strange that we should come year after year, and plead for you to promote these interests of which you are the appointed guardians!

You all know how this drinking habit debases, degrades, brutalizes, pauperizes; and how industry is deadened by it; how it languishes under its painful influence, and how peace and prosperity and contentment and happiness all flee before it; how it does evil always and everywhere, and does good never and nowhere; how at this moment it dangerously threatens our government, by the reckless, violent, lawless spirit it engenders. A large appropriation is asked of our state for the establishment of an agricultural college. It is proper, it is fitting, that the state furnish every aid and opportunity and advantage for this vast industry, that engages more than half our people, this pivotal industry on

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which so many other industries center, on which the welfare and prosperity of our state at large so much depends, but if the liquor traffic were totally and forever banished from our state, it would do more to elevate the farmer and promote all the industrial interests of our state than many colleges in many years could do. To establish colleges and at the same time to countenance beer and liquor drinking, is to act not the part of wisdom. It is to build with one hand and to pull down with the other. Can you afford to be so foolishly employed? I will not so offend your intelligence as to suppose that any one of you believes that any proper, legitimate enterprise is dependent upon drinking for its support, its financial support; and yet this is and always has been the all-powerful argument that has been offered by your society to justify the saloons on the state fair grounds. If our state fair is dependent for its success upon beer and liquor saloons and games of chance of any kind, it has indeed fallen very low, too low, as was seen last fall, far too low for any civilized community.

Gentlemen, members of the society for the promotion of agriculture and the mechanical and industrial arts of our state, we pray you most earnestly and most seriously that you will withdraw—you who are the appointed guardians of these industries, we pray you in behalf of these very industries, that you will withdraw your financial support, approval and countenance from the drinking saloon; that you will prohibit all beer and liquor selling on the state fair grounds, and thus we shall ever pray.

President Bascom—Mr. President and gentlemen of the board, this subject has been brought before the attention of several religious bodies of this state at their annual meeting. It was brought before the Synod of the Presbyterian church. They are not represented here by committee to-day, but their action was essentially the action of the other bodies that are represented here to-day. It was brought before the Conference of the Methodist church. They would have been here in full committee, had they not misunderstood the time of your meeting, supposing the proper time to present it was to-morrow, rather than to-day. On their part, how-

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ever, their resolutions and a short address has been handed in, and I will first draw your attention to them.

(Resolution of Methodist Episcopal church of February 23, 1885, read.)

The Congregational Conference, which met last fall in Platteville, made the following report in their minutes.

(Report of committee on temperance read.)

The question which doubtless presses your mind in this matter, that is brought before you as closely as the other, is the financial success of the fair, and yet you understand, as perfectly well as we understand, that the financial success of any fair is entirely secondary to its real success, as promoting the interest for which the fair is instituted; and now, gentlemen, we are profoundly interested in the advance of agriculture. We are willing to do, at all times, all that we can for this great end which you have in view, but it is perfectly plain to our minds, and it seems to us it must be perfectly plain to your minds, that no financial success, that tends to sacrifice the morality of the community, that tends to impress upon the community wrong lessons of living, can at all compensate for the disadvantages which attend such a measure, or its object and means of securing the well-being of the farmers. Let me, in that connection, simply mention a fact that President Merrill, who was here, but was compelled to leave before this hour, mentioned to me in connection with Fond du Lac. He said that the county fair in Fond du Lac last year refused to have any sale of intoxicating liquor, or allow any gambling or horse-racing, and that, for the first time in seven or eight years, it met all its premiums, and without any deficit. It made it instantly a financial success.

Perhaps there is one other thing that weighs on the minds of some of you, and that is that you do not wish, being an agricultural society, to commit yourselves to any other line of action or movement, you wish to hold a line of action impartial, and think it does not become you to stand between the temperance men and those who hold different opinions upon this subject. I think that is a low ground to take. You will remember that you are a voluntary organ-

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ization, ordered for the interests of agriculture, and no man can separate the interests of agriculture from temperance, however diligently he may strive to do it, however profoundly he may wish to do it. The interest that you have in hand is deeply and unchangeably interlocked with that of temperance; but, even granting that it does not become me especially to draw attention to that fact, did you, during last year, stand even-handed between temperance men and those who hold different views upon this subject? Not at all. Did you find those saloons on your ground? No. You brought those saloons with you. You did not take things as you found them in Madison under the law. You created a totally new state of things in Madison, and you gave conditions that rendered it impossible for us to apply, even to our own youth in Madison, or to the youth in the county of Dane, the ordinary precautions which the law supplies in connection with the ordinary saloon. You brought an entirely new set of circumstances here, and you brought them in such a way that they favored, and markedly favored, and terribly favored intemperance in this community. We ought not to disguise this fact. I was on those grounds repeatedly. I saw old men fall in drunkenness to the ground and uncover their bald heads, such a sight as I have rarely seen any where. Boys partially intoxicated, men hiding themselves under the straw, to be pierced with the fork, in the morning, by those who carelessly tried to feed their cattle, not knowing that their heaps were the resort of these drunken men.

There was marked disturbance there Wednesday night and Thursday night, a spectacle, on the whole, the like of which I have never seen anywhere in the amount and character of drunkenness and open violation of law. Now, gentlemen, you may say, and very appropriately — I accept it, so far as it goes, that you did not license any gambling, yet there was gambling, open and protracted, on those grounds. The men who were convicted here a few days ago for burglary in Waunakee were on that ground gambling that day, and had been through other grounds gambling, and their gambling, part of it, was perfectly open. I saw it

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repeatedly. There was no difficulty whatever in seeing it. Now, if that was not authorized, I do not think it essentially alters the fact that here is a great institution which is affecting the moral character of this community, and which is so ordered that there is open and constant gambling in it, and if it came without your order and recognition, it came very largely in consequence of what you did recognize — the saloons, that were kept open. If there had been no drinking, there would have been no gambling that would have been open and public, in my judgment.

Dr. Martin — You should not make such charges. You cannot prove it.

President Bascom — This point, it seems to me, is a very strong one, that the farmers are the most temperate portion of our population. They are the most universally opposed to the use of intoxicating drinks and very many of them, I should put it as high as seven in eight, feel themselves affronted, to be obliged, in meetings which especially belong to them, to identify themselves, as they are compelled to do, with the sale of intoxicating drinks. I believe, gentlemen of this board, that if you decide to allow the sale of intoxicating drinks on your state fair ground, you do not represent any considerable fraction of the farmers of the state of Wisconsin (Applause), that you do it on your own personal responsibility, not only against the sound opinion of the Christian men and women in the state of Wisconsin, but against those very persons whom you represent here. There are many things to be said upon this subject. There are many lessons to be taught by the state fair. It ought to be one of the most interesting and one of the most instructive occasions in the whole circle of the farmer's year, but what were those lessons? They were lessons of disorder and the utter defiance and spurning of law. As I say, I have never been in any place where the laws were so completely trampled upon, spit upon, despised beyond anybody's enforcement or thought of enforcement, as they were on those fair grounds last year.

Now, consider the circumstances. Above all places, there ought to be sobriety there. Those grounds are crowded;

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you desire to have them crowded; we go there that we may crowd them, but a single drunken man there may endanger the lives of those who go there. Those grounds, above all places, require a strict police, sober men and sober citizens. I can not see how any men, who have the responsibility which attends upon the gathering and ordering of such a crowd, can venture to give intoxicating drinks free range among them. The exhibitors on those grounds demand more protection than they had last year. Property was unsafe on those grounds. Men spending the night there in drunkenness, how easy it was for them to fire the straw! how easy it was for them, unintentionally or intentionally. As I say, these blacklegs who had been all through the fairs were there. Why were they there? Because the conditions were such as to give them peculiar advantages. That is why they were there. They take the range of these fairs, and then, after the fairs are over, they take the night for burglaries. That was the history of these fairs last year, and property is not safe under those conditions, and, therefore, you impose on your exhibitors undue care and undue danger, when you ask them there, and at the same time surround them by conditions which are dangerous, and exceedingly favorable for all sorts of thoughtlessness, all sorts of lawlessness, all sorts of stupid indulgence of appetite.

Now take the young men who come there. They above all young men ought to be protected from that kind of temptation. They, above all young men, not being accustomed to the nearness of these temptations, feel the temptations unusually strong. One of the officers of this town, admitted that, to his knowledge, one young man, who had been on the grounds of the state fair the previous year, learned or acquired the disposition to gamble, and acquired the appetite for intoxicating drinks, and has been good for nothing all the year, and dated it directly and specifically from the State Fair which occurred one year ago. If we could trace it, it would be surprising if there were not many young men found in much the same condition in reference to the State Fair which occurred last fall. It can hardly be otherwise than that an institution so ordered must in due time

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decay. It is quite possible that for one, two or three years a certain pecuniary advantage may be gained by pandering to the worst element of society; but, in the measure in which that is done, the best element of society will withdraw from it, and, in the measure in which that is done, the objects which you have in view will signally fail to be met, and finally there will be a crash which will be complete. Those men whom you gather by means of the saloons have no interest whatever in agriculture. Those whom you offend, because of the saloon, are deeply interested in agriculture. Those who will stand for good order and morality, are those who will stand faithfully by the interests of agriculture, and those who withdraw from the one will ultimately withdraw from the other, and, if this society breaks down under those conditions, it will go down with the saloons which it has nourished, and which have pulled themselves to the earth, and this society with them.

Now, if I have spoken somewhat strongly, I have spoken strongly and earnestly because I feel, judging by the past, that this subject has not made the impression upon your minds which it is making in the community at large, and I believe that not only will those interests that you represent not sustain you, but I do not believe there is any considerable number of thoughtful, earnest men in the state of Wisconsin that will sustain this sort of action.

Dr. Chapin — Mr. President and gentlemen of the board: I shall take but a very few minutes, for there is very little need that any thing should be added to what has been already presented, so ably and so forcibly, by those who have already spoken. I have been watching for more than forty years the unfolding of this state of Wisconsin. I take pride in that which I have seen of the development of its material interests, of its educational interests, and the advancement in the various lines of the moral and religious character of the state. For the last thirty-five years I have been identified with one of the educational institutions of the state and from that point have not only watched the course of things, but have been called by my duties to contemplate these varied interests. Those pertaining to the industrial de-

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velopment of the state, and the interests of the whole country, have come under my especial observation, and all of these matters, as they come before me, press upon me here. I can only allude to them as indicating a reason why I feel very strongly on the point which we have now before us. I do believe that this agricultural society is, as has been already intimated, one of the most important of our educational institutions; and that it is of the highest importance to it, and to its influence as an educational institution, that it shall stand simply for its great end, favoring all that stands directly related to that end, sobriety, morality, order.

The points have already been put, and I need not dwell upon them. It occurs to me simply to ask you what is the object of your annual state fair. Is it just to gather the farmers and the manufacturers together for a good time? Is it to meet the idea of that saloon-keeper that was referred to, who said "Fair time comes but once a year, let us have a jolly time and go it strong to the end?" Will the fair, with that end in view, accomplish what we desire to accomplish? On the other hand, is not the thing to be accomplished by such a fair to bring together those who represent the various industrial pursuits of the state, where they can see calmly and study carefully, and with interest, each the labors of the other departments? Is it not that those who are engaged in these different departments of labor shall here find light and knowledge in respect to one and one another of those things which will bear upon his own calling. You want an orderly meeting, you want a meeting which will enable those who gather there to go about and discern clearly and distinctly what there is for them to take away from that meeting, and for that purpose you certainly want to avoid everything which will interfere with such a visitation. You want to interest the sober men, the men who are the mainstays and the yeomen of our state, those who have done and those who are doing more than any one else now, to develop the industrial interests of the state. Those are the people you want to invite there, and, if I understand it, though I was not present last year, very rarely have I been able to be present at the general

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state fair, yet, from what I hear respecting it, the attraction of an occasion such as that was is to another class, and the very fact that that class came in such numbers does of necessity exclude every class that you want in order to make that fair really bear upon your educational work. It is your object lesson for the whole state, and you want the intelligent, sober, earnest working men of the state — those who are not drawn by the appetite for drink or any of the things that are associated with it. You want that class to come and gather a lesson which they will carry home with them. Instead of that, I contend that, by the course that has been pursued, you bring just the other class, and gradually that will inevitably exclude the class who are most to be benefitted by such a gathering. Now in our part of the state, I am inclined to think that, in Rock county, and the adjoining counties, if you should take a fair vote of the agricultural people, and those who represent manufacturing interests, you would find four fifths of them indorsing the plea which we make here to day. Can you afford to slight that feeling; and for what? As far as I can understand, the only plea given is that there may be a sort of financial success to show for the year. Is that an end worthy of you, gentlemen, and especially when you consider the cost involved, as indicated by these presentations.

Now, I hope that these considerations will weigh with you. Make a fair experiment. I am sure that all the moral and sober part of our population will join most heartily in approving the action which we urge, and you will find that part of our population rallying around the interest which you aim to subserve, standing by you and giving you a financial success far superior to anything which you obtain by licensing liquor selling. But my time, I think, is up. I only rose for the sake of simply giving my hearty indorsement und approval to what has been said. I will only say a word further with reference to identification of the interests of your society with the interests of sobriety and morality. Dr. Bascom referred to it. It grows upon us more and more, The more that I study political economy in all its phases and in all its bearings, that the thrift of the people, their capacity

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to develop the resources of nature which are furnished them in the states in which they live. their capacity to stand together and support one another in the mutual relations of these various industries, depend upon intelligence and morality, and the two things are utterly inseparable, and if you undertake, by your conduct, your course of education, so to speak, to exert an influence which is unfavorable to sobriety and morality, you are damaging the interests of the very men you represent. Better, far better, in my judgment, to abolish the fair altogether, than to have it contribute to such an end.

I believe that is the belief of all who study the matter carefully and thoroughly. I can conceive of no claim, that any part of the community can make upon you, that you should furnish facilities for drinking in your fair, I can conceive of no reason, other than that which has been named: You want a financial success. Some one said that some two thousand dollars was added to the treasury of your society by the license paid. I do not know whether that is a correct figure or not. It matters not. So far as just the occasion is concerned, that might have contributed to a kind of success. But what did that two thousand cost? Who paid the two thousand dollars? What did it cost, I mean beyond the mere payment. These saloon men could pay you two thousand dollars. How much more did they extort from the people who were there visiting; and what is the bearing of just that kind of expenditure on the thrift of your society and those who are its constituents. These are things that, it seems to me, are worth considering. They bear upon it. And the mere fact that you can get an income by licensing these things, it seems to me, is, when you come to look at it its bearing in this light, a reason why it should be refused, that we should save the farmers and those who come together on these occasions, that great expense, for it detracts just so much from the ability of your constituents to sustain the society, as you would be glad to have it sustained. There is that side of it to be looked at.

I will not detain you longer, except merely to express again

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personally my interest in the society and in all its operations. I regard the unfolding of the resources of the state of Wisconsin, as it has gone on, to be something to be rejoiced in, something for which we may well thank God. I hope that it will go on more and more, and that this society, in connection with other institutions which have grown up in the state, during these forty years and more that I have watched, will all bear in the one direction — to increase intelligence, sobriety and morality, and in that way touch the very springs of inventive genius, and of earnest, faithful industry and labor in every department, such as will tend to secure peace and harmony, such as will settle the questions between labor and capital, such as will tend to further all the great interests, the economical interests of our state, and I bid you God speed in your attempt to do it. I believe you will take these things into consideration, and, it seems to me, the difficulty is one which comes upon you, not from us who stand here to day; we have behind us the voice of the great majority of the constituency of your society and those who love the interests of the state of Wisconsin.

A. A. Arnold — Before these committees retire, we desire to say that, while we are not working from so high a standpoint as you are, our labors are labors of love, the same as yours, for the good of the people, and we desire in receiving you, to receive you with that respect which is your due, and in considering this matter, after you retire, we will endeavor to give it a fair impartial consideration, and before you leave for the sake of having some guarantee that the best people of our state will patronize our fair, we would like to have from you some expression that will guarantee us in that kind of assurance. It has been said that these temperance people are full of resolutions, but when they come to attend a fair, they do not spend their money as freely as the beer drinkers. You know these things. There is no use of my repeating them, and I do not wish to advert to them, but we would like to have some assurance that, if we have a state fair where intoxicating drinks are excluded entirely, that the better portion of the people will attend the fair. None will be allowed except beer in any event, and, if allowed,

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only to a very small extent. This year we will try the experiment, and if the temperance people of the state do not stand by us, next year we will go back to our former custom.

Dr. Chapin — I think the resolution of the convention, as read, indicated that as the desire of that body, so far as that body was concerned. The first expression is that of interest and of confidence, and a desire and a recommendation to all the members of the church connected with that body, that they shall favor the society, and favor it in every way, possible, provided this matter is made right.

(Dr. Bascom here read resolution to prepare an address to the people, urging them to go to the fair.)

Dr. Bascom — I will only say, for myself, that if Mr. Babbitt will not make me a dead-head by sending me a free ticket, and the society adopt this action, I shall surely be there, and yet, gentlemen, I can not believe that it is your purpose to make a dicker between the temperance men and the liquor men on this point. I do not know but the liquor men might out-bid us, if we chose to put it in that light. I think that one great advantage of the temperance men, which you really desire for the farmers, is that they spend their money with caution and prudence. I would not give much for the prospects of a farmer who did not have deeply rooted in him a sense of economy, and who wasted the money that should go to his wife and children on intoxicating liquors. I trust that this society does not consider that a thing that they ought to encourage, that they should have on their grounds those who will waste their money in drinks that will debase them. I have no doubt we stand on higher ground than you, but I do not believe you stand so low as that, and on that ground we do not offer any special trade, but I will be there very gladly, and pay all that devolves on me and my family to pay, if it is a place that I can afford to go to without sacrificing my character. I felt last year that if I was there without a strong, earnest protest, I did sacrifice my character, and so I thought that every citizen who would go to such a place as was offered us last year, without an earnest protest, did sacrifice his character as a good law-abiding citizen.

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Secretary Babbitt— In order that we may not be misunderstood by the remarks of President Arnold, I would say, and I think I have a right to say, inasmuch as I am not a St. John man, that we do owe to the temperance people some degree of consideration for the magnanimous, noble and generous support that they gave us last fall. I also wish to say that they were the only class, political or religious, that we could put any confidence in whatever, and that they responded manfully to the call of the officers of the Wisconsin State Agricultural Society. I wish to say that much, and I wish further to say that I shall not vote with the temperance people this time on the grounds of policy. I wish to be fairly and squarely understood. I feel grateful to you temperance people for the generous support that you gave. Your representatives brought into the coffers of the society $2,000 more than was ever brought into the society on Wednesday, and you shall have the credit for it.

Mr. Wood offered the following resolution:

Resolved, That intoxicating drinks, including beer, shall hereafter be excluded from the state fair grounds during its exhibitions.

Mr. Fratt moved that the further consideration of the matter be postponed until to-morrow morning, which motion was carried.

OPENING ADDRESS BY PRESIDENT ARNOLD.

Representatives of the Industrial Interests of the State of Wisconsin: We are assembled once more in annual convention, at the state capital, to discuss matters affecting all classes but more directly for the advancement of agriculture, aud for the betterment of the financial aud intellectual condition of farmers. For these purposes I recognize you as representative men of our class, and would recommend earnest work and a hearty co-operation in all that may be decided to be for our best interests.

At this my first appearance before you as President of the State Agricultural Society, and as such, ex-officio moderator of this convention, I desire to state that it shall be my

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earnest desire to rule on all questions of order in accordance with parliamentary practice, and to so direct the convention, as that little time shall be wasted in discussing matters not pertinent to the questions under consideration, or not of primary importance in a convention of this sort.

The papers as they appear in our programme, will have precedence in the order therein named, allowing after each a reasonable time for the discussion of their prominent features. Other questions, not named in the programme will arise, but they should only be considered on presentation of a proper motion, or resolution, or informally by the unanimous consent of the convention. If this course is pursued (and I shall look to you for assistance), we shall have met to some purpose. Matters foreign to the object of this convention will be excluded, rambling talks on non-esentials will be avoided, and we shall have opportunity to come to some definite conclusions on the subjects under consideration.

My worthy predecessor, Mr. Fratt, filled this position and indeed I may say all the places wherein it was his duty as president of the society to preside, superintend, advise or execute so fairly, courteously, with such marked ability, and for so long a priod, to the satisfaction of all, that I feel that it will be no easy task for me to any way fill the position as well.

However, the trust is mine, and it shall be my constant endeavor to discharge the duties to the best of my ability, that the state fair, the state convention, and that the State Agricultural Society generally may be as useful as possible to the people of our commonwealth.

During the past year God through nature has blest us with abundant harvests, and although we may not rejoice at present prices, no provident person in our state need lack for food or proper clothing.

As usual some political changes have been made, but the majority rules, and under the benign influence of our political system made practical by liberal education, and the influences of an enlightened christianity, the minority yield to the constitutional majority invoking less of strife or per-

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manent bitterness than can be found with like changes within any other civilized nation.

With our political status better secured than any other people, with no strifes at home or fear of foreign interference we have ample time to look about us and direct our attention to our immediate and individual welfare.

With the farmer as with all honest men, the thing of prime importance is the means whereby we may make an honest living, maintain comfortable homes and lay by a sufficient surplus as a safeguard against penury in old age. To this end should the laudible endeavor of all men be directed. For this, and for the maintenance of an intelligent understanding of our occupation in all its details these conventions are held every February, when it is the duty of every inquirer after knowledge in our vocation to listen attentively, and in turn impart such knowledge as he may have obtained by experience or otherwise, that may be of use to his fellows.

It is too common among our class to find those that think they know all that is worth knowing, therefore the slow progress made in the art of farming and the lack of other progressive farmers at those conventions.

The changes that are the natural sequence of improved machinery, diversified labor, and ready transportation in all parts of the civilized world render it important that the American farmer keep his eyes open if he would keep pace with the times, and thus have a recognized standing of value, either financially, politically or socially.

To the first of these, success in business is the only proof, unless from the legitimate business of farming a man can make money and that in some reasonable ratio to the laborer's skill and capital employed it is a business not worth a personal following.

If to become a farmer, a man must leave all questions of political economy, and public interest for other men to decide and he be the mere machine to cast the ballot, then he should be disenfranchised and never be allowed to hold an office. And if to become a farmer a man must neglect all means of refinement, refrain from books, and literary enter-

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tainments, keeping himself and his family from all contact with the outside world, and thus ostracised from other society, then and in either case he is indeed to be pittied, and no wonder that those that so understand the situation, underrate the business and its followers, wondering how it is that farmers should assume to understand questions of universal interest, or in any degree undertake to shape public sentiment.

Disguise it as we will, wealth brings many comforts, luxuries and refinements that cannot otherwise be obtained, and the most potent argument in favor of an occupation is that there is money in it, and as popular sentiment now is in this country when this is once proved, to wit, that there is as much money in this as in other pursuits, its standing will be assured.

In England the land owner is a gentleman; to be such, is the highest ambition of the farmer. When once he becomes a landlord, there is at once blue blood infused in his veins and he is elevated to a higher position in social and political life.

It costs money to be the holder and owner of land in fee simple in England, not only on account of the scarcity therof and the consequent high prices of the same, but for a still more cogent reason, that the profits are so small that none but the rich can afford the luxury.

When land will only return a revenue of from one to three per cent. on the investment and other investments will return from four to twenty-five per cent., it is like being a member of the British Parliament, all honor, but no cash returns.

In Canada the farmer is usually the owner of the farm he tills, and he is at least, a very respectable gentleman, but with not quite as great importance as in the old country.

They are more Americanized and stand more for what they are worth. Then much time is devoted to attendance at fairs and the like, the young are taught that it is one of the most honorable of callings, and the government is liberal in its appropriations for the purpose of educating its farmers. Young men there, on their way home from the church and

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the lecture often stop at a neighbors barn and note how the stock is doing, how they are handled, and from that they seek to adopt, improve and excel. This pride in the business, this disposition to excel necessarily prompts much endeavor. In the eastern, middle and southern states the better class of farmers feel and maintain their importance. I can now recollect while a boy in the state of New York, at our social gatherings of the young, clerks and all young men not farmers' sons were at a discount until they had obtained a standing, and this took some time. Farmers' daughters were much sought after for wives by all classes of intelligent young men, not only for their beauty and freshness, but for the more potent reason, the probability that they would become useful wives. A farmer of any sense knows that the wife of a man in no other calling has so much to do in a business way to make his business a success as does the farmer's good wife.

"They talk about a woman's sphere
As though it had a limit,
There's not a place in earth or heaven,
There's not a task to mankind given,
There's not a blessing or a woe,
There's not a whispered yes or no,
There's not a life or death or birth
That has a feather's weight of worth
Without a woman in it."

In the west land is so cheap that almost the poorest can obtain it, so fertile that it has not been considered worth while to use any brains to cultivate it, and the country has been settled to some extent by the ignorant, or by those that have failed in other pursuits. Thus we have been measured and thus we do not occupy such a place in the public esteem as the occupation would warrant under more favorable circumstances. Intelligence and thrift are the necessary precursors to influence.

Education is the result of investigation, and wisdom the proof of its application. Positive influence, individuality, each and all come to those that earn it, and if they are worth having, and the farmer expects, he must use the means to the end.

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This convention is one of the means.

Agricultural fairs are gotten up that the people may meet socially, that they may see the choice products of the farm, and to study the many improvements in machinery whereby we may make farming more enjoyable and profitable.

True, many times there are things connected with them that in no way tend to educate for the better, and we often hear their usefulness berated. As a rule, however, only such amusements and indulgences are allowed on the grounds as the public sentiment demands, in accordance with the laws of the land in order to get out a paying crowd. "Money makes the mare go," and the mare that can trot makes the people go. And I have noticed that people that have much to say about the "annual horse trot," go at least one eye on it. We would not see near as much harm in the world if we were not so constantly seeking to make harm out of it.

"Has't thou given the horse strength?

Hast thou clothed his neck with thunder.

Can'st thou make him afraid as the grasshopper?

The glory of his nostrils are terrible. He paweth in the valley and rejoiceth in his strength.

He goeth on to meet the armed men.

He mocketh at fear, and is not affrighted; neither turneth he back from the sword.

The quiver rattleth against him, the glittering spear and shield. He swalloweth the ground with fierceness and rage; neither believeth he that is the sound of the trumpet.

He saith among the trumpets, ha! ha! and he smelleth the battle afar off, the thunder of the captains and the shouting."

The horse is a beautiful animal, and the man or woman that cannot see more beauty and utility in a horse of fine mettle, symmetrical in form, grand in action as best displayed on the trotting course, than in the dunghill, is at least narrow or not well up in the horse business.

We should in every practical way endeavor to make our fairs proper educators, not so fine, however, as that only the most proper people could enjoy them, nor yet so loose as to invite only the depraved to the exclusion of the refined.

It is the province of the good, the intelligent and the refined to build up, by precept and example, correct public

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sentiment, for these are such as alone can do it. When once formed, it seeks crystallization, and it is then the duty of legislators to give it the form of law, and those in positions of public trust to see that it is enforced. All laws not in conformity to this principle are pernicious, for they will not be enforced, and thereby induce disrespect for all law, and a general laxity in our courts. We should therefore be careful and not demand of our law-makers any action, even on what we believe to be the most desirable, until the public need demands it, public sentiment approves it, and public executives will be able to enforce it.

I would modestly suggest, however, that an improvement might be made in the department of education, if we had a law requiring that in our common schools all books should be bought by the district and paid for by raising money for this purpose at the school meetings, the same as taxes are levied for other school purposes, thus enabling the children of the poor, as near as may be, to enjoy equal facilities for a common school education with those of the wealthy, also a more compulsatory school law.

The great reason why there are so many children in our state who do not attend school is on account of the expensiveness of school books under the present haphazard, go-as-you-please system. With every change of school there is a change of books, and handled as they are by the local book seller, they cost double what they would if purchased by quantities, so that in the end the plan suggested would be the cheapest for the tax-payer as well as better for the poor.

Popular opinion also favors a more practical education. We have learned that a healthy community cannot be made up of the highly educated alone, nor yet of the ignorant. Education is only useful where it can be used. Theory often is correct, but it is only useful when it can be applied. If not practical, pernicious. A liberal christianity is condusive to good morals. Good morals will restrain vice and corruption, and inculcate correct ideas of honor. These with a widely diffused practical education will build up healthy communities and give stability to a republican form of government.

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To obtain and maintain this last we must give encouragement to a practical course of study, a text-book of "first principles of agriculture" should be in use in all our common schools, and no person allowed to teach therein unless he or she could pass an examination in this, the same as in other branches required to be taught in these schools.

I don't believe in the principle of taxing the masses to confer a higher education on the few. The principle of taxing the rich to educate the children of the poor, like many other provisions of law wherein private property is taken and appropriated for public purposes without the owner's consent, is only allowable (and the courts have uniformly so decided) as a public necessity for the general welfare. And unless this higher education of the few at the expense of the many can be proved to be for the general welfare, it is not excusable. However, this is the way we are traveling, and with the advice of many wise and good men, so there is no good reason why the coming farmer should be excluded from some of the privileges, for certainly he pays his share of the taxes. In this view of the matter, the coming farmer may be in advance of the present, that he may stand shoulder to shoulder with other men in all good works. I would recommend an agricultural college in our state, where the boy who desires to be a farmer may learn the skilled and technical parts of the business he expects to follow in after life, where manual labor is a part of the course, and that every day and as regularly as he takes his meals or his attendance in class.

This for the purpose that he may be handy, and learn to apply, and for the more potent reason that he may not be instructed in a school where he is likely to acquire a distaste for the very business he is being educated to follow. A college of this kind in our state turning out one graduate for each county each year, would give us a class of young men to draw from that would be useful in other ways than as simply farmers. Perchance in time we might be able to have a more equitable proportion of farmers in congress, more commensurate with the importance of our industry. Young men that have to work their way through col-

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lege, generally turn out to be useful citizens, no matter what occupation they follow, while those that have made no sacrifices to obtain an education are often worse off than if they had never entered college.

Boys and girls graduate to young. Like early matured animals, they will endure for a season, but are more fitted for show than utility; they are not fitted for business, they are not even fitted for teachers, the very atmosphere of a mere theorist will injure a boy's prospects for useful citizenship. There is no man so bigoted as he that has not been out of his own particular sphere, be he teacher, preacher, doctor, lawyer or farmer.

There are no new truths, we all know them, and are perhaps conscious of their influence on ourselves, yet the fact remains that so long as "what we shall eat, what shall we drink and where with all shall we be clothed" is a question of importance to all Gentiles, the question of a business education will be an object of interesting contemplation for the young and to the provident fathers and mothers of our land.

The constitution of the State Agricultural Society provides, that its officers shall be elected by its life members on some day during the holding of the annual fair, and that the presidents of the county agricultural societies shall be *ex-officio* members during their term of office, entitled to all the privileges of life members.

I desire to call your attention to this fact, and to the fact also that these presidents of county societies seldom take part in the affairs of the state society, as is their privilege, thus putting it in the power of a few life members that may be in attendance to control its management.

I hope hereafter to see all these county societies represented at our state fair, and would recommend that you pass a resolution memorializing the legislature to so amend the law fixing the permanent appropriation of $100 to each county society, to the effect that the president or the secretary of the county societies shall attend the state fair each year, and be there the whole time to be called upon by the different superintendents of departments as they may be

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best fitted to serve, to act as judges on the various articles competing for premiums. And that they also be required to be in attendance and participate in the election of officers. That the expenses of these presidents be paid by the county or state societies, and that the secretary's report of these county societies to the secretary of state shall embrace the facts of the fulfillment of these provisions before they can draw their annual appropriation.

The object of this proposed innovation is apparent and it is unnecessary for me to detail its advantages.

I hope that the county societies will also elect two delegates to attend these annual conventions so that hereafter we shall have each county society represented in our deliberations.

We should broaden up this convention as fast as possible and make it more and more useful as time goes on. It is an agricultural college for us old farmers.

I hope the legislature will be able to fix upon and pass a law making a permanent annual appropriation to the State Agricultural Society the same as it did by the county societies, so that we shall not be compelled to be constant petitioners for what every person knows is for the best interests of the farmers of the state. It is purely a labor of love, there are no salaries, not even the president or treasurer or any of the executive board, the secretary alone excepted is salaried and his duties are more manifold than people imagine. There is work the whole year in his office if made profitable to the society or to the state at large.

I am told by our worthy secretary that the transactions of the Wisconsin State Agricultural Society are much sought after by men of intelligence in all parts of the union. The press comments from the best agricultural journals in the eastern states where they should be good judges and have ample opportunity to compare them with those of their own states, are of the most flattering character, and to use their language, we "outrank them all." I am not very familiar with the transactions of other state societies, but have examined some of the leading ones, and without prejudice, I say none of them are better. In Illinois $5,000 per

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year is given to the agricultural board to be used by the agricultural society, and I fail to see that it is more useful to their state than ours is to our own state. Mistakes have been made in the past and will be in the future. The motive of all those that have to do with the society, has only been for the mutual good, and the testimony of those whose opinions are worth consulting is that the Wisconsin State Agricultural Society is a success thus far. What it will be in the future will depend not only upon the future efforts of its officers, but upon the hearty co-operation of you all. With your assistance, together with the rapidly advancing interests of our state, it should be even more prosperous in the future than in the past.

I am glad to see so many farmers here with their wives, and I congratulate the wives that to all appearances, they have husbands that would accord to them some of the advantages they constantly possess of getting away from the humdrum of the farm. We are always happy in the presence of the refined, and they our mothers, sisters, wives and sweethearts are our queenly ideals.

If I mistake not their part of our programme will be fully as well appreciated by us, and by others as our own efforts. I am pleased to see men of all professions here from different sections of the state, for there is no better or more acceptable way of receiving new and advanced ideas than by the intercourse of people of all callings, thereby also giving us a better and more charitable understanding and appreciation or our respective labors in life.

I hope to have the pleasure of seeing at our meetings many of the members of the legislature now in session, as many as their time will allow and not interfere with their official duties. I bespeak for you a pleasant and profitable convention.

As has been the custom in the past we will follow the rule and allow a reasonable time for discussing any prominent point that may be made in any paper read. We expect criticism, and perhaps some extravagant things are said for the purpose of provoking discussion. This paper, like all others, is open for criticism.

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Mr. John W. Hinton, of Milwaukee — You have read a very emphatic and, in my humble opinion, a very able address, although it did not go quite far enough, implying thanks to him to whom all thanks are due, that we were free from anything like attempts at foreign interference, if I understood you right. Not long after in your very clear and straight-forward address, you also alluded to the fact that farmers should not be mere machines, that they should study for themselves, teach themselves, learn for themselves and understand for themselves what is called political economy. Now I confess to have been studying what is termed that for some forty-six years, and I wish to be candid with you. I do not know as much about it to-day as when I began. As to foreign interference, let me say to these farmers that when the wealthiest, most powerful, most far reaching, and at times, the most destructive organization to American interests that ever existed, boasts, through its organ in that land from which your ancestors obtained their liberty, that they will never rest while the United States are unsubdued, and report it in their official proceedings, I for one was very glad to have you tell these farmers to study for themselves, teach themselves and not be mere machines.

One other point is well worthy of attention. I am not going to make a political speech in any way or shape. That was in reference to sending farmers to congress. There are 196 lawyers in congress, and, meaning no disrespect to the profession, I think that is about 194 too many, and I tell you that over this state to-day there is one thing that has done a good deal of good, incites a good deal of hope, and has brought cheer to the homes of a good many farmers, and that is, that the farmers of Wisconsin are beginning to know something, and send a good many farmers to represent them in the legislature. That is a good healthy sign. I am not here to flatter farmers, I have never and never will stoop to flattery, but the more farmers, in reason, well selected, calm, judicious intelligent men you send into your legislative business, the better you will be represented. There is no mistake about the vastness of this agricultural interest. Why,

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going back centuries, one of the grandest old men that ever lived in England said, and I remember as a boy seeing it on a placard in the British Museum: "Agriculture and pasture are the two great breasts of nature, from which nations derive their nourishment." No man will ever live long enough to be able to say anything better than that. Hence those two simple remarks, and I think you wrote perhaps more wisely than you yourself realized, are full of value and full of thought, and I hope they will carry their weight; they are entitled to it. (Applause.)

Mr. J. C. Ford, of Madison. As there are some important measures that are recommended by you in your address, and measures which are important to the agricultural interests of the state, as contained in the governor's last message to the legislature, I would move that a committee of three be appointed by the chair to take into consideration those measures of interest to this society, and to express by resolution at some proper time when the questions may be discussed, the sense of this convention.

Motion carried.

The president appointed as such committee Mr. Ford, Hon. N. D. Fratt, and Mr. Wood, of Baraboo.

Hon. W. D. Hoard, of Fort Atkinson, was then introduced by the president as "the most exquisite story teller in the state."

Mr. Hoard — Which reminds me of a story. I always believe that it is the duty of every man who has a hope within him to be able to give a reason for that hope. This getting up and saying something whether you have anything to say or not puts me in the condition of an old judge in Williamsport, Penn. He was one of these kind hearted, juicy, succulent old souls whom everybody liked, and who would get mellow occasionally by too undue familiarity with the seductive wiles of John Barley-corn. A preacher was holding forth one night at a protracted effort, and, in the course of his remarks, he suddenly struck what he meant to be an impressive attitude, and says, "Show me the drunkard! show me the drunkard!!" To the consternation of everybody, the old judge, unsteadily enough, pro-

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ceeded to get up and balanced himself as best he could and says, "Here I am, sir. That's me — all over!" The preacher realized a little quicker on his investment than he had calculated, and didn't know where to put his elephant. It set him back a little, but finally he got going along, and he struck another attitude and shouted, "Show me the hypocrite, of all men most despicable! show me the hypocrite!" The old judge rose the second time and reached his cane over to an old deacon and says, "Deacon, deacon! Why the devil don't you get up when you are called upon." Of the two, I had rather be the judge.

Now this is taking a fellow a little at a disadvantage. I never believed in apologies, but you will allow me to make an explanation. Your worthy secretary wrote me to be present, to my evident benefit, and I wrote him that I expected to be in New Orleans at this time, and I have not expected until to-day to be able to be here; and no man who comes before an audience like this, composed of the best brain of the state, should come without due preparation, with his thoughts well arranged. To do so is not showing this audience that respect which is its due. However, the worthy president let me out at the very outset when he said that rambling talks should be avoided, consequently I will say but little. Wisconsin farmers have reason to congratulate themselves as much, if not more than any set of farmers I know of in the United States. I never was so powerfully convinced of this fact as I was this last autumn. In behalf of the New Orleans Exposition, I undertook a trip east to work up the dairy exhibit. I went into Ohio, Indiana, Pennsylvania, New York, and finally into Canada, and every where I was convinced of the fact that the average farmer of those states was not flourishing any where near as well as were the farmers of Wisconsin. I found in New York, for instance, men farming on lands they valued at $100 an acre, with cows in dairies, and not able to show more than $30 to $35 and $40 apiece from those cows. Everything bore to me a pinched look as though sustenance had been denied it, and I think that if the farmers of Wisconsin, particularly that portion south of the Fox and east of the Wisconsin

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River, were to go out and see the world they would see for themselves the fact that they have one of the best sections of country that God ever made in which to practice farming.

If I were to go into poetry I would quote Bishop Heber;

"Where every prospect pleases, and only man is vile."

The fact is, gentlemen, the country is ahead of the men that live in it. God had builded wiser than the men who have occupied this land have supplemented his effort. We hear a great deal said about improving the breeds of our cattle. Gentlemen, I want you to address yourselves squarely and thoroughly to the question, "What shall we do to improve the breeds of farmers?" We need to-day, if we need anything, a projecting into the agricultural brain of this state a bomb or something that shall stir it to its very center, and shall stimulate it and make it understand the grand and great destiny which lies before it, and the responsibilities that bear upon it. Why, taking such a country as this is, as you took it, many of you, forty years ago, fresh from the hands of God, endowed with elements of fertility matchless on the globe; no country in all the broad land more kindly to man in everything than this Wisconsin, and taking such a country as this, and proceeding to farm it, and keep farming it until the average production of wheat ran down from twenty-five to eight bushels to the acre, I tell you the indictment is pleaded squarely and fairly against the intellectual character of us farmers. Now what are we doing to intellectualize the agricultural brain of this state. It must be done. This convention, and measures like it, are necessary to that very end. We need something more. My friend, Mr. Hazen, and I have been pounding for twelve years trying to get the man who keeps the cows to attend the conventions and become stimulated and affected by the thought that goes out there. We have been unable to do it. It is impossible to bring the mountain to Mohammed. Mohammed must go to the mountain. Consequently I feel in myself a very deep interest that the agricultural mind of this state shall crystallize in some direction

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which shall move upon the great mass of our farmers and thereby instruct and invigorate and stimulate.

I believe in the idea which I have heard broached here, which Minnesota is already taking up, of establishing farmers' institutes all through the state. The appropriation of public money, under the proper direction, will be one of the most blessed influences that we could bring to bear, and I am decidedly in favor of it. The Wisconsin Dairymen's Association took this state when the actual milk product of the state was not worth more than $2,000,000, and has landed it to-day where a placard is placed in the New Orleans Exposition that reads: "Corn is king, the cow is queen. Wisconsin with her dairy of 560,000 cows produced in 1884, 38,000,000 pounds of butter, 30,000,000 pounds of cheese, and the total milk product was worth $20,000,000." I tell you, gentlemen, that those forces have been carried on by a dozen men, and the education that has gone out, and that has permeated and stimulated all this state in that particular has come from a little traveling institute which never had until a few years ago more than $125 in its treasury the whole year long. Now, these traveling institutes, which worked at the thought and the brain of men, are at the bottom of all this progress. The condition of our agriculture sometimes reminds me of the story of the Irishman, who, in going through the woods, discovered a man sunk in a quicksand hole, and rushing over to a man who was chopping wood, a sort of a saw-boned Yankee, he said: "Come here, for the love of God; come as quick as you can; here is a man sunk in a morass." "Is there," says the Yankee. "How is he in?" "Begorra, sir, he is in up to his ankles." "Oh, then, he will get out." "Not by a dang sight, sir. I forgot to tell you, sir, he went in the other end first." That is just exactly how we go in — the wrong end first. We quench the mind. Agriculture has been all along esteemed a question of drudgery. We need something to take hold of this question in a new light. We need stimulation. In my own business, if there was no intellectual stimulant to it; if it was this constant hard work, for the little money I get out of it, I would do, as many a farmer does, blow out my brains

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or get a divorce, or run away, or get chronically drunk; do something for a change.

Now, I feel that on this point we need to crystallize the agricultural minds of the state upon the question of agricultural education. It is not that our farmers do not know enough, it is not that our farmers have not good brains — I do not say that — but I say, gentlemen, that agriculture is a question of thought. Why, gentlemen, show me our farmers as they go through the land, the average of our farmers, and they are men of hard hands, and weak heads. "That is true," said a farmer to me not long since, "I turn around and look at my brother farmers, and I hear them say, 'the farmer manages nothing, the farmer furnishes the votes but his brain enters into nothing.'" The farmer to-day furnishes the brawn and the strength of the community, but he is not a manager, he does not make the laws, he does not move the forces of society, he is not there, and why? Because of his mistaken notion that farming is a work of the hands purely, and not a work of the head. Let me call your attention for a moment to a remark made to me by H. O. Armour, of the firm of Armour Bros., the great pork packers. The Armour Bros. and myself were raised upon neighboring farms, boys together, played in the same brook, and went to the same school as farmers' boys. Standing on the board of trade in New York city and looking over that large assemblage, the men who control to-day, more than any other body of men, the commerce of the nation, said Mr. Armour to me: "How many of them do you think were farmers' boys?" I said: "I have no means of knowing." I was astonished when he answered, "Eighty out of every one hundred." Now I tell you, gentlemen, that it is no lack of brain in the farmer, it is there, but it needs stimulating, it needs action, it needs taking hold of these interests, and we ought to feel as much pride and as much grandeur, and as much stimulation in our business as farmers as do the lawyers.

Thanking you for your kind attention, I am, yours truly.

Hon. J. M. Smith was called upon and spoke as follows:

Mr. President, Ladies and Gentlemen: I did not intend to talk to-night; I do not want to talk to-night; but after

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listening to my friend Hoard in what he has said about Wisconsin, I want to indorse that. Within the last few years it has been my fortune to travel a good many thousand miles in our country, and through some 20 or 25 different states. In traveling about as I have, I always try to keep my eyes and ears open to learn all that I can in regard to the agricultural industries and the agricultural products of the different states through which I travel. I have had occasion to remark a good many times that in no state in which I have traveled within five or ten years have I seen so many signs of general thrift, of general intelligence, as we see in Wisconsin. We have no farms in this state as large as some in the western states. We have no farmers I think as wealthy as some of the farmers in some of the other states, but there is a scene of general thrift that is unmistakable as we travel from this state into the others, and particularly so as we travel south. In going south the farming grows more and more defective all the way from Central Illinois till you get to the Gulf of Mexico. We hear a great deal about the Sunny South, about the southern climate, about the southern soils, and about the possibilities of the south. I am not here to run down the south. It is a part of our whole country and our one country, and they are a part of our people. I have been there for some two months past, and have been treated very handsomely by them. I do not want to run down their country nor the possibilities nor the capabilities of their soil. I simply want to say what I think with regard to their soil as compared with Wisconsin, and I tell you my friends that I have seen no part of the south where I would give for a certain number of acres the same number of acres in any part of Wisconsin. My friend, Mr. Hoard, referred to a certain portion of Wisconsin as being particularly good. He has not traveled in some other portions of Wisconsin, I imagine, as much as I have. The largest crops that I ever saw in my life growing on 120 acres of land, I saw growing in the northern part of this state, north of Oconto, on land that a few years ago was an unbroken wilderness. I traveled over it with a great deal of care, have been over it a

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number of times, and I have never before nor since seen such farm crops growing on 120 acres as I saw on 120 acres of land in Oconto county. I mentioned this to show that the good land is not all south of the Fox river, or the productive land. I do not know how I can express myself to compare the south with the north. Take the state of Mississippi, for instance. I have traveled through that several times, and on different roads, but if the governor of Mississippi would come to me to-morrow morning and say to me (I have 45 acres of land jutting against the city of Green Bay),—if he should say, "Deed me your 45 acres of land up in your cold Green Bay country, and you may go down on the Mississippi R. R. and select 1,000 acres of the best farm land that you can find in sight of either of the roads that run lengthwise through that state, and I will see that you have a clear title for those 1,000 acres in return for your 45 acres up there in the snow banks of Green Bay," I would not touch it, I would not think of it for a moment, and I do not believe there is a man in this convention that would do it. We often complain of our cold climate, our long, hard winters, and some cold winters, but, to me, they are more agreeable than the winters in the south. I had actually rather endure one of our northern winters than a southern winter. I say this, not hoping to make a speech, but I thought perhaps a few words from my experience in that line might be worth something to those who are rather discontented with their lot in Wisconsin. I tell you it is a splendid state to live in.

The following letter was then read by Secretary Babbitt:

CALDWELL, WISCONSIN, January 28, 1885.

Dear Sir.—By request of C. S. Miller, I send you an article to be read at Agricultural meeting. A portion of this tariff is not in accord with my past writings and I presume will create a feeling among wool-growers, yet as they now express my sentiments I offer them as the best means at hand for adoption among sheep-men, generally.

I presume our radical brethren will attribute this course as rather too democratic. Yours,

A. H. CRAIG.

P. S.—The article was prepared for Mr. Miller but he could not now conscientiously father the tariff reform.

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THE SOUTHEASTERN WISCONSIN SHEEP-BREEDERS AND WOOL-GROWERS ASSOCIATION.

Mr. President: It is with pleasure I present this paper for your consideration, and although I may not express thoughts wholly new to you, yet it is hoped that some benefits may accrue by its presentation.

This society was organized in 1863 for the purpose of stimulating an improvement in the sheep industry of southern Wisconsin. The means adopted were novel at the time, but it has gradually worked itself up, until to-day it stands as a grand monument in the midst of thousands of flocks which surround it in every direction. These means were the annual public shearings which have been continuous for twenty years; which have provoked competition; which have stimulated improvements, not only in the highest but the lowest flocks of our section. It has attracted almost universal attention; hundreds of reporters have written up its proceedings and thousands of people of southern Wisconsin regard it as an indispensable holiday.

To this organization, more than to any other means, does Wisconsin owe her popularity as a breeder of thoroughbred sheep as well as the valuable quality of the wool produced. Not only has this society bred improvement at home, but its influence has been felt throughout the entire west. Numerous similar organizations have sprung into existence and have copied our proceedings, and, to supply the demands of these new organizations, thousands of pure bred sheep have been drawn from the flocks of our state, which has still further encouraged home production in quality and quantity.

I will not dwell upon the success attained by the constant and united action of our people, but I wish to call your attention to the indisputable fact that competition, no matter in what form, is the great lever of improvement, the great wheel of progress and the secret of success. Our competitive association drew upon the latent talent of our ingenuity. It induced, first, curiosity, then actual competition,

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and to-day we boast of more than 130,000 high grade descendants of Spanish Merino sheep within a radius of ten miles of Caldwell, the head center of this organization.

For years this section has been traversed by numerous buyers and speculators who have exported our surplus stock. One year alone 40,000 sheep were shipped from this section, but, gentlemen, it was not the year 1884.

At the present time there is a deep depression in the wool industry. We have suddenly struck against the sand bars of adversity and for a year have lashed the shallow waters into a continuous foam. We have petitioned for a redress of our grievances. We have written column after column protesting against an injustice. We have argued our positions, begged for the attention of those we wished to champion our cause and we have lectured upon the subject until we despair of ever having the lost restored.

Now that we have settled down to this conviction, I ask myself what have we gained by our public demonstrations? Nothing. What have we lost? The confidence of capital and the confidence of every sheep man who now actually believes that he is a martyr to the injustice of legislation and is engaged in a business where there is no profit. Is this correct? Have we not by our own lashings helped to dig the gulch into which the wool industry has fallen? I know that this reasoning will be ridiculed, and that I shall be treated as a *traitor* to the wool-growers' government, but in justice to all let us be candid. All industries are low, why should ours be an exception? Depression falls upon all of the cereal productions of the land. How could we expect to maintain our former position if no reduction had been made?

Wheat at sixty cents and corn at twenty-five is of itself a standard from which all else must suffer. It is true we are making no money on wool at the present prices, but where is the business that boasts of its profits?

We have ten cents per pound protection, an amount, which, if properly guarded, must restore confidence and yield a profit. 1884 is not the first year we have sold wool at twenty-five cents per pound, and, although I do not see

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the advancement coming as rapidly as I would like to see it, yet under the sober influences of reason I know that a change must come. Lashing the waters will not remove the bar, but by encouraging words and a skillful application of the advantages still left to us we may raise our craft from the sand-bar of despondency and regain the foot-hold we have lost during our period of lamentations and despair.

It is not in the course of natural events that we should expect to recover the wonderful prosperity which has marked the past, but by judicious management and the maintenance of judicious laws we may yet hold our place in the ranks of the great agricultural industries of this country, and, although wool and its productions form the second place in the imports of our nation, yet as a people we have the ability to produce at home the deficit which now goes to enrich foreign wool-growers and foreign manufacturers.

It should be the aim of our people, the aim of our government, to seek all legitimate means by which we shall produce within our own borders all materials which are congenial to our climate, our soil and our resources.

The wealth of a nation depends upon her own productions, and whatever material can be successfully produced must naturally add to the wealth of that nation.

We know the ability of our competitors in the great wool-growing centers of other nations. We know that their favored climate, their vast areas of uncultivated lands are wonderful inducements for extending their flocks, doubling their productions, and giving them an advantage in the markets of the world, yet with all these unequal elements to contend against, our resources are abundant, and our facilities capable of achieving a home triumph if not forced over the precipice of destruction from which we are now slowly struggling to retrace our steps, and in the knowledge of our own experience devise means by which we shall avoid unnecessary principles in breeding and invent those which shall be of the greatest economy in the future.

A. H. CRAIG,
Caldwell, Wis.

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Mr. Hinton—I would like, before that language is left in the minds of these gentlemen, to correct some very erroneous statements. Mr. Craig and myself are personal friends, and I have often had the pleasure of speaking at Caldwell's Prairie upon that same subject. He very truly speaks of the deep depression in the wool business. Now let me tell you in a few words something perhaps not known to all of you. In 1883 the tariff was materially lowered upon wool. John Sherman, of Ohio, gave the casting vote which politically damned him. Ohio would have voted dead against him. I have attended every great wool convention that has been held for the last two or three years, and am well acquainted with almost all of the very prominent growers there assembled, representing every state and territory in the Union, and if you will take the writings of Mr. John L. Hayes, the publisher of the "Wool Bulletin," in Boston, who was also president of the tariff commission, and if you will take what he said before the tariff commission and what he recommended in the tariff commission, and then read what he did there, you will think that this wool question is a good deal like what the Schleswig-Holstein question was in Europe. Everybody was talking about it and nobody understood it. Lord John Russell, when prime minister, was asked in the house of commons to explain it. He got up in his extremely affable manner and said, "I would be very happy indeed to give the gentleman the information he asks for, but unfortunately there never was but one man who understood it. He told me all about it, but he died soon afterwards, and I have forgotten what he said, and the devil of it is there is nobody that knows now."

Now take the effect of this. In 1883 the wool tariff was lowered. The duty was also lowered upon ready made clothing. Now we are apt to think in this country that we are all very smart, and we are apt to call Germans "Dutchmen," because they do not see things very quickly. The manufacturers of Berlin tumbled to it in an instant. They sent over their agents to New York and got the new-coming patterns. Ladies like to change their patterns every year you know. They then proffered to make ladies cloaks at a

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price so low that it seemed impossible of belief. In 1883 there was $902,000 of women's cloaks imported into the United Sates under the old tariff of 1883. Under the new tariff there was $5,100,000 worth imported, and I think my friend Carr will tell you that they are selling Berlin made cloaks at the Grange stores. Marshall Field, of Chicago, bought $125,000 worth. He regretted it, but said he had to keep them to compete with others. He said it threw from 400 to 500 cloak makers, women, out of employment in Chicago.

Now, curses, like chickens, come home to roost. I am not speaking here politically. A good many square democrats fought the reduction of that tariff manfully and squarely, patriotically as I believe. The result of lowering that tariff upon manufactured clothing was such that it threw nearly 20,000 sewing women out of employment in New York. That is in Sunset Cox's district, remember, the great democratic free trader, certainly one of the most brilliant men in this country, but I tell you, when a man gets 20,000 women after him, God help him if he don't do something. What did he do? They went right to him and he introduced a bill in congress to restore that tariff of 1883. Now I am giving you facts accessible to all of you. My friend Craig is a very clever man, but you know you cannot hold a ship down in the water unless you have got a good deal of ballast down near the kelson, and if Mr. Craig or any other man can show me how, with our 50,000,000 of sheep in this country, in a large portion of it, having to feed them three, four, five and sometimes six months out of the year, we can compete with sheep in Australia, South Australia, Queensland, New Zealand, the Cape of Good Hope, portions of South America and South Africa, I would like to have him do so Let me tell you, those are wonderful sheep at the Cape of Good Hope. I have seen sheep there with tails that weighed twenty pounds. They have little wagons to carry their tails on. Any sailor will tell you that. There they do not feed a pound of fodder or put up a particle of shelter. Here are thousands and thousands of sheep running in this state on land that will sell for $50 an acre. There they run on tracts of land for which they pay three cents an acre

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rental. They have 95,000,000 of sheep, and here we have from 48,000,000 to 50,000,000. There is the secret of the whole thing.

I confess I know of nothing upon our tariff schedule that more palpably, plainly and squarely shows the necessity of a tariff on wool, and I am very much surprised at some remarks in that paper. I happened unfortunately to give an agricultural address at Waukesha once, and made some allusion, as it was a prominent topic at the time, to the Green Bay question, and my friend Craig went for me very roughly, and I was asked to go back for him. Said I, "That man and I will be firm friends yet. He don't understand me. He don't know me. If he did, he would like me."—(Everybody likes me that knows me.) And we became fast friends. My friend Enos, the postmaster at Waukesha, was invited to give an address on the tariff at Caldwell's Prairie. He asked me to be a substitute for him. I don't know why. I went out there and spoke. In Mr. Craig's paper it said that nobody had ever spoken there that had set so many farmers thinking as I had. I remember one little story, and then I will stop. The question came up how the farmers were robbed by the tariff. I have heard that for forty-six years and never believed a word of it, and do not believe it to-day. Somebody asked about salt. "Well," I said, "that was terrible; the way the farmers were robbed on salt was wicked." "Why," said I, I went to Waukesha, and went into a store and told them that I wanted a couple of tubs of butter for family use. He showed me one of about forty pounds and another of about fifty. I happened to see the husband of the lady who made the butter. Said I, "I don't ask you to weigh it; that old woman is as straight as a string. I will take her word for it. It is as good as gold." For mischief I took the top off. There was about one half inch of salt. I looked up to this man and said I, "What is that salt there for?" "Oh," he says, "that is to hold the cloth down, you know." "Oh, that is it." I turned the cloth up, and there was about half an inch of salt under the cloth and next to the butter. "Well," said I, "what is that for?" He says, "That is to keep the cloth from sticking to the butter."

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"Well," said I, "I am learning now as sure as you live. It is a good school for a fellow to learn." I took the tryer and ran it down, not to test the butter. There was about half an inch at the bottom. Said I, "What is that for?" "Why," he says, "that is to keep the butter from sticking to the tub." Says I, "that is queer; I have always been told that everything moves on a trinity in this world." "Well," he says, "you know we buy salt for about a cent a pound, and if we can get 25 cents for it we are doing middling well." Now on this wool question, if you will look it up, you find no part of the United States where you can compete even-handed, and for that reason, coming from a gentleman like Mr. Craig, conveying the idea, perhaps not intentionally that we can compete, it is worth while to look at the facts. That question lost Ohio to the republicans the year before last. Every wool grower in Ohio bolted the republican ticket on account of that. It was an off year, it is true, but every one of them bolted the ticket, and there are about 48,000 wool growers there, and probably over a million in the United States of wool growers and those immediately connected with them. It is a very grave question, and you will have no question before you here that will affect you more than that will, and that is the only reason why I got up to make a few comments on that letter of Mr. Craig's.

Mr. D. R. W. Williams, of Helena, Wis.—I do not propose at this time in the evening to discuss the question that has been raised, that of the establishment of an agricultural college, but I think it is one in which the citizens of the state of Wisconsin have a deeper interest than almost any other question. In the year 1862 I wandered up around this institution. It was practically then nothing in its success. As an institution of learning the state of Wisconsin could boast of no state institution of which any of its citizens could feel proud. The progress that has been made since that time in the developmment of the state institution is such that I believe every citizen would feel proud, and I am glad to see the interest manifested in the question of education, and of how the young people and old people and all can be so aroused in intellectual activity as to produce the grand-

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est results, not only in agriculture but in every department of science and art. The question of agricultural education is one that comes directly down to this point; how can the agriculturists of this country acquire that mental training, that mental discipline, that will give them that power of thought and that power of action that has distinguished other professions and other classes of learning? The simple teaching of the art of agriculture alone does not do this, but thorough mental discipline is what is necessary for the farmer, and without that same mental discipline he cannot grasp the great principles of agriculture, which require as much thought as any other class of learning.

We want therefore not only a knowledge of the particular principles of agriculture, but we want as much mental discipline, as much development of the power of thought among our farmers as among any professional class of people. It is too late to-night to discuss this question, but I am in hopes that during this convention this question may be so discussed that, if possible, the people of this state and the legislature may come to a conclusion that will have a tendency to develop the farming interests to the largest possible extent. I always feel diffident in addressing a body when I know that many of those who are hearing me are already weary with what they have heard and discussed, but, to throw out an idea of what I want to communicate, it is this, what is farming? Is it simply digging in the ground? The largest part of the farming of this country to-day is done in the machine shop, and the farmer to-day must not only hoe corn and plant seed and know how it is made to grow, but he must be a practical mechanic, for no man can be a good farmer now without he understands something of mechanism. Even a woman cannot conduct the domestic employments unless she has some knowledge of mechanism by which she can use her sewing machine. As I understand it, we have had in science hall, which is now destroyed, as good a mechanical department as any there has been in the country. In that science hall can be found the advantages necessary to develop mechanical talents, and shall the state furnish two such opportunities? Shall they furnish two

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grand mechanical establishments? Or will one, if it is properly conducted, answer for the farmer, the lawyer, and everybody that has a tendency to mechanism, just as well as to divide the two? Can the farmer get along in under standing his occupation without a knowledge of chemistry?

We are proud to know that our institution of learning furnishes an opportunity to study that branch, with its laboratory, its facilities and its professors, equal to any separate agricultural college that can be named. We have built up here an institution of learning and literature that furnishes to the farmers every opportunity to learn, and learn mental discipline, that can be obtained anywhere. If we have not made it such, it is the interest of this state to make such appropriations that it shall be made such, and when we have made it such and are proud of it, are we going to send the farmers away somewhere else so they cannot enjoy the advantages of the means of learning in every branch which it is supposed that the lawyer's son, the doctor's son, and every other man's son except the farmer's shall have the benefit of? No, sir. As a farmer I claim that every farmer's son shall have every advantage of acquiring a literary education, a mechanical education, a knowledge of botany, and a knowledge of everything pertaining to farming that any other class of men possess, and if we build up here a splendid institution of learning, where can he find it as well as in our great state university. (Applause.) Is that university all we desire to have it. Is it what it ought to be? It is only a few years ago when our state institutions were nothing that anybody could feel proud of. Just a few students alone would come here for graduation, but now it is booming up equal to any other state institution in the country.

It is true that our state agricultural college is nothing to what it ought to be, but is the fact that it is not what it ought to be any evidence that we cannot make it, as we have made the literary institution what we would all be proud of? It is not the farmer's son alone that becomes a farmer. The lawyer's son, the mechanic's son, the laborer of any and every class, is just as likely to become a farmer as the farmer's son. You cannot breed men so that every one will

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have the same disposition or the same capacity. One will make a good farmer, one will be adapted to the law and another to mechanics, and there is no use in trying to cramp them down to any particular profession or calling. It is the great question with every young man, not how he shall get something to eat, or how he shall get something to drink, but what he is fit for, and a large proportion of the failures in life are owing to the fact that we fall into vocations for which we are not adapted. In the early education of youth we cannot tell their actual capacity, but if we educate them so that they will be fit to fill any calling in life, they are far more sure to make a success than if we cramp them or leave them ignorant. Now, gentlemen, what we want is not a separate agricultural college, it is not a 400 acre farm. If we are going to have a college here of which we will be proud, I expect to see it attended, not only by hundreds, but I trust it shall be attended by thousands.

Can you on a 400 acre farm furnish employment in agriculture for 400 boys and girls? No, sir. It is too cramped. Is there a single farm any where, no matter what its size, which is what this agricultural college wants? No, sir. We have a great variety of soils. Here is the sand belt; here is the country up in Oconto county. Here is the drift region, and there is the great lime stone of southwest Wisconsin. There has been no practical experiment made to show the farmers what kind of manures or fertilizers can be used to grow the largest possible crops with the least possible outlay. There have been no scientific investigations made in that way, and the investigation on no single farm will answer the purpose. Careful, thorough experiment should be made on the different soils of every part of this state, and men placed in position capable of making those experiments and bringing them together in such a form that the whole community of farmers may have the advantage of them. The farmers of this country for twenty years continued to raise sorghum, and believed that sugar could not be obtained from it. By a few careful, scientific analyses it was determined that under certain conditions the crystallization of sorghum or the juice of sorghum could be secured with just

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as much certainty as the juice of the southern cane. This year the United States sent out on to a farm here in Wisconsin, a chemist, by the request of Governor Rusk, at his urgent request, that we should have a careful examination made as to the adaptability of sorghum for sugar purposes in this state. A careful analysis was made twice a day of the juices. The same chemist was sent by the United States government on to the largest sugar plantation in Louisiana, and the same thing was done, and the result is that our northern sugar cane contains just as much crystallizable sugar as the southern cane, and that, while it will cost less than a dollar a ton to raise sorghum in the state of Wisconsin, it costs $2.50 to $3.00 a ton to raise the ordinary cane in Louisiana; that the northern sorghum not only possesses as much sweet as the southern cane, it possesses, on the authority of this chemist, actually as much crystallizable sugar as the southern cane, and he believes that if certain experiments more are made, by which a defecation can be made that will separate this sugar, that sugar can be produced cheaper in Wisconsin than in Louisiana. Now, I say, that you want an experimental farm that is not confined to four hundred acres, but that careful and thorough experiments be made in the soil of every part of this state to determine the fertilizers and the methods of cultivation that will produce the largest results with the least cost. You have in your institution here one chemist and the superintendent of the farm, and you have confined the whole attention of the agricultural department to that spot. Your agricultural college has failed because you have not given it scope enough. You have not in this state any one capable of telling what is the disease of a horse or a critter. There is nothing that a farmer has to do with more than the health of his animals, and there is no instructor in this state now able to give the scientific knowledge that will teach the people of the state the proper conditions by which the cattle may be kept healthy, and how they may determine the different diseases. We have no professor of animal anatomy and physiology. A professor of that kind would be just as valuable to the welfare of the

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farmer as the medical college that teaches the doctor how he shall deal with the human patient. If the state would get such a professor, and the farmers would come up here and get a course of lectures, it would be the most interesting lectures you ever heard. It is no experiment. And so, the agricultural experiments we need are no experiments. If the state will furnish the means of getting that information, you will find any number of men willing to help, and, instead of having only a few young men going to college, you will find your young men and your old men flocking in there to get all the information that is possible.

WEDNESDAY, February 4th.

The matter of allowing the sale of beer on the fair grounds was called up, and Mr. J. M. Smith moved that a vote be taken separately on the question of whether the society should allow any games of chance, and on the question whether they should allow the sale of liquors.

President Arnold—We have decided already that no gambling shall be allowed. I desire to have the board and the public understand the position the society has taken. We cannot decide in every case, as a board, what are games of chance, and what is gambling in the legal acceptation of the term. The board has decided that they will allow no gambling on the grounds as far as we know it. If some one yesterday in one corner of the room here had bet that this lady would have spoken twenty minutes, no one could have prevented the bet being made; and just so on the fair ground. Gambling may be there and we not know it, but no gambling will be licensed and allowed on the ground if we can prevent it. No beer will be allowed on the ground, if we have power to prevent it. We are going to enforce the rules, whatever they may be, and I think the board will be unanimous in carrying out whatever the majority of the board decide. I do not wish to indicate to this board what course it shall pursue. I take it for granted that every man on this board has a judgment of his own, and whatever his views

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are he will here express them. I am aware that if we exclude the sale of beer on the grounds it will entail a great deal of work and a great deal of responsibility, but we will use the power of the society and the law to execute it.

Secretary Babbitt—Perhaps it might be well to see how far this gambling business goes, whether it is to include horse-racing or not.

President Arnold — That is not gambling.

Secretary Babbitt— It is not half as honest as the wheel in my experience in the last fifteen years.

President Arnold—I desire to say that the remarks that Mr. Bascom made here yesterday were very ill-timed and not in good taste, if he desires to convince the board, when he virtually insults the society by saying many things that he did say. He used many good arguments, but he upset the whole by saying what he did say. If he saw so much drunkenness, and so many men in those heaps of straw, he must have been around spending all his time hunting those cases up. I did not see a man on the grounds that was drunk. I saw a great many men that had too much drink. I did not see any gambling. I did not make it my special business to hunt them up, but if a man was around seeking out those things, and seeking to injure our society by advertising it, he had an opportunity and could probably do it.

Mr. Martin — It was my business to hunt them up, and I was allowed twenty policemen and two detectives, and from 7 o'clock in the morning till 7 o'clock at night I defy Pres. Bascom to prove that there was one drunken man on the grounds. Talking about men that could not stand up and all that sort of thing, it is not true. I was allowed twenty men, and from 7 o'clock in the morning till 7 o'clock at night remained on the ground. There was not a man on the ground after 7 o'clock at night, at any time after the first night, and three men placed at each gate to prevent their coming back. They were told not to admit anybody on the ground after 7 o'clock at night. It is not true that there were drunken men on the ground. It was said so, but it was not true.

Mr. J. M. Smith offered the following resolution: *Re-*

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solved, That the sale of intoxicating drinks, beer included, be excluded from the fair grounds during the fair of 1885.

Mr. Wood — The original resolution that was laid over till this hour was as follows: "*Resolved*, That all intoxicating drinks, including beer, shall hereafter be excluded from the state fair grounds during its exhibitions." I would prefer this form of it, for we do not want this discussion to come annually upon us, and this, if passed, would settle the question until it is rescinded.

Mr. Smith withdrew his resolution, and the resolution of Mr. Wood was seconded.

Mr. Wood, of Baraboo — I know that long winded discussion here is altogether out of place, but as the mover of the resolution I believe that it is my privilege at least to state very briefly, as I will try to, my reasons for presenting it and advocating it. In the first place I believe in it as a general principle applicable at all times and in all places, and in the second place I believe that it is applicable to our exhibit, for one reason because we know that a liquor license on the state fair ground is a very different thing from the ordinary run of liquor licenses, say in the city of Madison. We have twelve saloons there. Now those twelve saloons, for the time being, are capable of doing a great deal more mischief, and they do more, and are far more demoralizing than any twelve saloons running at their ordinary gait would be in the city of Madison. They are worse.

This question has attracted for a year past very widespread interest. I may say with propriety that the eyes of the whole state are fixed upon us. Now we have got to decide one way or the other, and if misfortune is before the society, as growing out of its adoption or rejection, we would be in far better circumstances to fall in a good cause than fall in a wrong one, and we had better appeal to the honest, the Christian, the moral sentiment of the state for support, rather than to the whiskey interest. I believe that is true, as a mere matter of policy, as choosing between the two, and it is evident that the time for this choice has come. We had better choose the honest and moral, rather than the immoral. Now, I resent with indignation every argument

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that is brought to bear here, in advocacy of the saloon interest on the fair grounds, that it is in the interest of the farming community that visit the fair. I would say that, so far as I know, the ones who frequent the saloons in Sauk county are not the ones that come to the state fair at Madison, and the saloons, if open in Madison, are not for their benefit. Put it to vote, and I believe that ninety out of one hundred of the men that visit the state fair from Sauk county would vote without any hesitation for the exclusion of the saloon. They do not come here to get beer. They come here for something else. The man that wants beer will stay at home and drink it; and his family will not be here. It is not a movement in the interest of the farmers.

Mr. J. M. Smith—I want a moment to reply to a word that Dr. Martin said about people's getting drunk on the ground. I am not in the habit of going around to hunt drunken men, but last fall, every afternoon, along towards night, passing by the saloons, I proposed to satisfy myself without taking other people's word for it, and there were certainly drunken men there. There were a good many that were in a very bad condition. One evening, along towards sun down, just before I left, I went away out near the far corner of the stock pens and saw a man there very drunk. He was unloosening one of the animals to take her out. I saw that he was in a bad condition, and asked him what he was trying to do. Says he, in a maudlin way; "This cow ain't in the right place. I want to get her out of here, get her where she belongs." I called the attention of the stock man to it, and he went and sent him off. If it had been an hour or two later, and he had gone and unloosed one of those large bulls, it might have been a very serious operation, and a very expensive one to the society or some stock owners. I mention this to show that there were persons there that were drunk. I say, try this. Give it a good, fair honest trial. I cannot believe that the honest temperance man and the well wishers of Wisconsin, will let the fair suffer, even financially, by our doing this.

Mr. Martin—There was to be no discussion about this, but Mr. Smith has now brought a charge of drunkenness. I

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do not mean to deny that charge. There was a man in the stock, half a mile away, in some corner in the fair ground, and he had something to drink and was moving a cow. There were men all around, but I did not go down there. I went about the saloons and all parts of the grounds, but I did not go down peeking into a cow shed. You might find a man in a cow shed trying to move a cow, and he might have had a little drop, and he might have brought that in his pocket. Very likely he did. He did not get it down there. He had it in his pocket and he might be drunk. Have you traveled in the south, and never seen a man drunk in the south leading a cow in the farm yard?

Mr. Smith—No sir, I never have.

Mr. Martin—Well, I pity you.

The roll of the board was then called on the resolution. In giving their votes, the following remarks were made:

Mr. Martin—I do it reluctantly, but if it is to be made unanimous I will say aye.

Mr. Ford, of Madison—I feel moved and inspired to indorse what Secretary Babbitt has said. At the same time, I congratulate the temperance ladies and gentlemen on the success of their work. I appreciate thoroughly the motives that influence them, and honor them therefor. They have succeeded in limiting the sale of liquor on forty acres of land in this state, after an effort of four years before this executive committee—the sale of beer, I would say. Of course the millenium seems far off in that point of view. The implied censure upon the society, and the attack upon the society, I do not appreciate. This society has been surrounded by enemies. It is the great representative interest, as I regard it, of the state. It needs all the friends of the state to co-operate with it, but there are local jealousies, there are local rivalries, there are local interests, that are all the time attacking it. I think we could have safely left this matter to the executive committee. They are honorable men, chosen from all parts of the state, and when they saw that evils were following the practice, I have no doubt they would have corrected it. There is a great tendency in the American mind towards crankism, to become cranks. The

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business of this society is something different from that of a merely moral reform society. It is moving forward to influence and improve the agricultural interests of the state. That is its main purpose, and I think we should keep to that main purpose, and while the society has been criticised, on the one hand, for selling beer, on the other hand they have been criticised in a directly opposite direction for inviting temperance lecturers to address the people of the state on the ground; and there seems to be no way that this society can suit all the people of the state. Attacks are made upon it from every quarter. While, personally, I rejoice in the success of this temperance reform, I think that the spirit that has animated the people in their attacks upon the society has not been wise. I want to see the people stand by it heartily and unitedly and give it the influence which it deserves in the state.

President Arnold—As president of the society I wish to say something. My private judgment, for the good of the society and for the good of the average farmer, would have been that we restrict the sale of beer to a moderately few numbers on the fair ground. As a man and a private individual I would have shoved the whole thing into the lake. I think that every member of this board, without exception, even Dr. Martin, as radical as you think he is, would take precisely the same ground. Now, I find that these temperance people want the whole thing or they will have nothing. Just so with the whisky men. They will have the whole thing or they will have nothing. We, as members of this agricultural board, cannot take sides on this question; but, inasmuch as we have now decided to exclude the sale of intoxicants entirely from the fair ground, this rule will be maintained. You know but very little of the care and anxiety there is attending this fair, and it is ill-timed and in bad taste to make public and demonstrate all the pernicious things that happen on the fair ground, and lay it all to this agricultural board, and especially make it unpleasant for the out-going president. Mr. Fratt has worked seven long years in a labor of love for the state of Wisconsin, without any compensation; the only compensation he has is to have these

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temperance fanatics come in and advertise all the faults of the society, and all the things that have happened wrong, and lay it to his charge. That is the kind of thanks we get for working for the public good. But we have assumed these responsibilities. We are not thin-hided, as the saying is. I am not thin-skinned, and I hope Mr. Fratt will be able to live through it.

Secretary Babbitt — He is in good health.

President Arnold — I appreciate his situation, and more fully appreciate it now on taking his position. Now I want you to understand that this rule will be enforced this year, and I will as quickly vote the other way next year unless we have a success at our next fair. This is our rule now. If we cannot make a success of this thing at the next fair, I will as quickly vote the other way. I claim to be a temperance man, but I will not let my temperance principles control my action, so far as the good of the State Agricultural Society is concerned. I am aware that there are thousands of farmers in the state of Wisconsin, that go to the fairs that think there is no more harm in taking a glass of beer than I do in taking a glass of water. They are educated that way. They are honest, good people, thrifty farmers; but there are people in this world who, because they do not eat cheese, say I shall not take cheese. They want to make a stomach that is going to fit everybody. They cannot do it. Now, gentlemen and ladies, stand by us and we will make this fair a success. I believe we can carry a bill through the legislature giving us a permanent appropriation.

Dr. Martin — For nearly thirty years I have come here to attend the state fair, and also to attend the annual meeting, without any reward, leaving my business. I voted always not to exclude beer, except once we tried it at Fond du Lac. They made promises then; those ladies made promises then, that they would support it. They did not help support it. We lost a couple of thousand dollars. Now then, the ladies in their resolutions say, "if you will exclude the sale of beer from the fair grounds we will send circulars all over the state and rouse the people up to help you; if you do not do

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it, we will issue circulars against you." These were speeches made here, and the newspapers published them, and they will go out all over the world. I wanted to tell Mr. Bascom when he was speaking that it was not so. Mr. Chapin, in the aid of temperance societies made a very beautiful and persuasive speech. I want to call the attention of these ladies to this point. They say, "if you will vote that no beer shall be sold on the grounds this year we will issue circulars all over the state and rouse the people up to help you." Will you keep your word ladies?

Mr. Lamb — You are a little mistaken in that; it was not the ladies that said that.

Dr. Martin — The resolution was offered by Mrs. Olin.

Mr. Olin — The resolution is on file with your secretary, and it does not say that.

Dr. Martin — It says, "We will issue circulars all over the state and will try to rouse the people to help you." If so I want to call upon you to do it.

Secretary Babbitt — You never can drive a lady, but I tell you they will work with us.

Mr. Lamb — I am part of that committee that Prof. Bascom was the head of, and that committee did have a resolution behind them just exactly as Mr. Martin says. We are pledged to stand by that resolution fully. You may expect us to do it. I say that to you all. We are in good faith on this subject, and I am glad to work in a good cause in that way.

Mr. Miner offered a resolution appointing a committee to revise the premium list. Carried.

THE DAIRY INTEREST OF WISCONSIN.

By W. H. MORRISON, President of the Dairymen's Association.

Mr. President, Ladies and Gentlemen — I am glad of the opportunity of speaking a few moments of the dairy industry of our state. Its commencement, its marvelous growth and its present proportions will be of interest to you and in in which you all take pride. "Willard's Practical Dairy

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Husbandry" claims that Jesse Williams, of the state of New York, was the originator of the present co-operative system of cheese making in 1851. As early as 1841, ten years prior Mr. A. Pickett, of Jefferson county, this state, was successfully conducting an associated dairy of thirty cows and to him properly belongs the honor of first putting into practice the American co-operative system of dairying.

The counties of Jefferson, Sheboygan, Fond du Lac, Waukesha, Brown, Walworth and Kenosha are the pioneer dairy counties of the state.

In an interesting and able article upon this subject, prepared by W. D. Hoard, of the Jefferson County Union and Hoard's Dairymen, read before the convention of the Wisconsin Dairymen's Association at Kenosha, in 1879, I give you some extracts which will illustrate how feeble were the beginnings of this great industry.

The first cheese manufactured in Wisconsin was made by Charles Rockwell in 1837. I have already referred to A. Pickett, who commenced operations in 1841. Milo Jones also of Jefferson county, was one of the pioneer dairymen. The first cheese factory erected in this county was built by Marshall and McCutchen at Cold Spring, in 1865; about the same time Stephen Faville built a factory near Lake Mills.

Hon. Hiram Smith one of the present Regents of our State University, writes the following: "At the first annual fair of the Sheboygan County Agricultural Society held at Sheboygan Falls, September 24 and 25, 1857, N. C. Harmen was awarded the first premium ever offered for Sheboygan county cheese. In 1858, J. I. Smith procured the first cheese vat and erected a building, he gathered the curd from the farmers before scalding, hauled it to the factory and cooked, salted, pressed and cured the cheese; it made most excellent cheese."

The following year 1859, J. N. Strong and Hiram Smith commenced manufacturing cheese in their own dairies and in 1861 began to take in milk from the neighbors. In 1858, J. I. Smith shipped the first cheese from the county to Chicago fifty-eight cheese in barrels, and sold it for eight cents per pound.

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In the volume of transactions published by the State Agricultural Society in 1852, Mr. B. F. Adams, in an article written by invitation of the secretary, says: "Those farmers who have turned their attention to the dairy business, are, many of them, of the opinion that it cannot be made a source of great profit, and consequently do not prosecute it with the expectation of realizing much therefrom. They regard our soil as not adapted generally to the growth of grass. At the present time many of our farmers keeping from two to six cows do not make butter enough for their own use. But little is expected, and they are not disappointed in their expectations." This is a true picture of a large class of our pioneer farmers, who could see no profit and never expected to realize any compensation, except from wheat, and it took some of them many years to learn the lesson so plainly written before them in the waving grass and beautiful flowers that grew so luxuriantly upon prairie and openings alike.

At the state fair held in Milwaukee in 1853, the dairy exhibit presented for competition was two tubs and four jars of butter and six cheese.

You can readily see by the foregoing that the dairy outlook previous to 1860 was not encouraging, but a few years has wrought a wonderful change, and to-day the brand "*Wisconsin*" on a package of dairy products attracts attention and entitles it to consideration and recognition of its merits in any of the great markets of the world, and this change is largely due to the Wisconsin Dairymen's Association, by their annual conventions, by their reports, by promoting inquiry and investigation in experiments, by first adopting the system of employing experts to visit the factories of the state and give oral instruction in the best and most approved methods of cheese making, thereby securing uniformity, by their constant and intelligent efforts to improve the quality of our dairy goods, and for the grand results which have been achieved, it stands at the head.

Let us look a moment at the organization. A call for a meeting of dairymen, signed by Stephen Favill, W. D. Hoard, Q. C. Olin, Charles Copeland, Chester Hazen and H.

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Strong, was issued. The meeting was held at the Linden House, Watertown, February 15, 1872. About a dozen dairymen were present, who organized the association.

The annual conventions of the society, held in different parts of the state, have been well attended, intelligently conducted, and have accomplished effective work. Many of the best workers in the association to day are those who assisted in its organization, and no higher compliment can be paid to them than to say that no opportunity has ever been lost to make an exhibit of butter and cheese. The first dairy fair ever held in the United States was held by this association, in connection with the State Agricultural Society.

I wish here to call your attention to an incident illustrating the importance of making an exhibit at the state and county fairs. At this first dairy fair a factory man, residing in the northern part of the state, who had been manufacturing cheese for two years, selling them near home and disposing of them wherever he could find a buyer, sent three cheese, not expecting to take a premium, but to see how they would compare with the make from other parts of the state, He won the sweepstakes, which secured him orders for his future product. At the Centennial Exhibition in Philadelphia, in 1876, Wisconsin cheese won twenty first premiums. On butter Wisconsin was awarded five first premiums, no state being awarded any more. At Chicago in 1877 we bore off more than our share of prizes. At the International Dairy Fair in New York in 1878, you remember that it was a Wisconsin girl, Miss Fanny Morley, won the Sweepstakes in competition with the world, for the best butter, made at any time or place. R. F. McCutchan, of Jefferson county, won the second sweepstakes on cheese against the world, the first went to Canada. And only last week our worthy and efficient secretary, D. W. Curtis telegraphed to Gov. Rusk that Wisconsin had won at the New Orleans Exposition first and second premiums for the best display of cheese, the grand sweepstakes and gold medal and two thirds of the other cheese premiums and in addition to make the cup full and running over, the sweepstakes

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on dairy butter. These laurels won by Wisconsin entitles it the proud distinction of being the dairyman's paradise. They have not come to one state by accident or chance but by persistent effort to excel.

At the present time our state has 456 cheese factories, 560,000 cows; producing thirty million pounds of cheese, thirty eight million pounds of butter and the total cash valuation of the milk product for 1884, was some over twenty million of dollars. Why this rapid development? Simply because it has been found profitable. Mr. William Phillips, of Lake Mills, a pioneer in the business, speaking a short time ago of the different avenues open to farmers' boys to gain wealth and secure a competency, said that he knew of no profession or vocation that yielded better and so sure returns as dairying.

Looking to the future there seems good reason for hopefulness, and yet I do not think the profit will be as large as has been secured in the past. The probability is that the aggregate product of dairy goods will grow much larger in our state; there will be increased attention given in its manufacture, more skill and intelligence will be displayed. Dairy farming is well calculated to restore the fertility to farms that have been impoverished by raising wheat as most of the produce is consumed and returned as fertilizers. Dairy farming, more than any other kind of farming develops energy, observation, skill, intelligence and a correct business routine. It is well always to remember that there is room for improvement. Make the *best* butter and cheese that can possibly be produced.

What are the difficulties in the way of the dairymen's future prosperity? Competition from the dairy region west of the Mississippi river. They have advantages over our state, as we have many over the eastern states, their cheap and fertile land. The advance in our farming land is becoming slow. It is necessary for us to rely more and more upon the profits as to excellence of quality. We must produce more and better at less cost. How absurd the idea that a farmer, a dairyman, should need no education; in this, as

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in all other vocations, a thorough knowledge and broad intelligence is requisite to insure success.

Another difficulty is the increasing manufacture of adulterated or imitation dairy products. To merely denounce it does but little good, and it is certainly not practical or wise to attempt to prohibit its manufacture, but we insist that we have a right to demand and every person in the state who prefers good butter to animal fat should say to our legislature, Give us some law compelling the manufacturers of adulterated goods to sell them for what they are. The most serious difficulty that menaces our future is the greed for the almighty dollar, to make haste to become rich. Banish forever the skimmer from our cheese factories, I do not think any special dispensation of Providence will ever permit even Wisconsin dairymen to make full cream cheese from skim milk. I said to a gentleman last week upon the receipt of the news from New Orleans, that so many premiums had been won on cheese by our state dairymen, that they had cause to feel proud. He replied, "Yes! I congratulate them, and think they must have taken all the good cheese that could possibly be found in the state, for I have been unable to find any that was rich and creamy for the past two months."

There is a class of dairymen, and I am almost persuaded that we have some in Wisconsin, whose chief study is to rob the cheese instead of enriching it, who care not for honor or reputation. Let our motto be: "The best is sure to win." If we suit the consumer, if we are anxious to meet their wishes and requirements, the demand will more than equal the supply.

This great industry is yet in its infancy and is destined to become larger. There is room for much more progress in education and experiment. The marked advance in the intelligence of our dairying will require the establishment of a professor of dairy husbandry in our prospective agricultural college, which will give to all intending to become dairymen such an education as may better fit them for their work, try experiments, make investigations, and in all practical ways educate that merit and excellence must be at-

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tained, and in this way the dairymen of Wisconsin will be worthy of the toast proposed at the housewarming of the Wisconsin state headquarters at New Orleans upon the award of so many prizes to our state: "The dairymen of Wisconsin, they have swept the board. Let the dairymen of other states sell their farms to the sheep and horsemen, and get into Wisconsin as soon as they can, where the grasses are so sweet and so rich that the most delicious butter and cheese, *the best in the world,* flows directly from the udder of the cow, and that in great quantities."

SANITARY PROBLEMS.

By ERASTUS G. SMITH, PH. D., Professor of Chemistry, Beloit College.

Mr. President, Ladies and Gentlemen of the Wisconsin State Agricultural Society:

Attention has been directed latterly to the importance of healthful homes and surroundings. Hardly an issue of even the daily press appears which bears no allusion to this important matter, while the papers of scientific periodicals and medical publications teem with articles pressing the demands for surroundings conducive to good health.

The second annual report of the Indiana State Board of Health bears the appropriate and significant motto, "Public Health is Public Wealth." The appropriation of moneys from both national and state treasury, and the appointment of professional men of ripest knowledge and soundest judgment for the inquiry and regulation of present or possible sanitary problems, lends force to the growing impression that the good health of its citizens is of even national concern.

The supreme demands for such organized investigations are not wholly met by the problems arising solely from the crowded blocks of our large cities. It is true that the peculiar conditions surrounding the massing of large numbers or small areas develop questions quite important in themselves, but such questions are by no means the sole province

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for research by the successful sanitary officer. The insidious germs of disease sown broadcast and running riot through the crowded tenement districts of the city, appear but too often unheralded along the streets of our quiet villages and enter the doors of the isolated home by the country roadside.

It is therefore, of prime importance that we should question the significance of measures taken by city sanitary commissions, and determine their bearing on less densely settled districts, as we are never perfectly sure, even in remote sections, that the airs are not burdened with disease, or the waters do not bear the germs of death. That such possibilities may arise, and that serious complications from careless or indifferent attention to home surroundings, have resulted most disastrously, the records and returns from our country physicians abundantly testify.

During years of intimate knowledge of farm life, attention has been repeatedly drawn to the alarmingly unsanitary condition so often surrounding the home. From the very nature of the occupation and the probable location of buildings, we would expect to find only such conditions as would contribute to a sound body and healthful living. The woeful neglect of the very elements of good sanitation in too many farms, and particularly in the smaller villages, renders patent to the careful observer how far from the truth such assumptions lie. I propose, therefore, to call attention for a time to the sanitary problems arising on our farms, and to particularly discuss them as centering on the all-important question of the water supply.

The pure water problem is not an easy one to solve. Locality, convenience of residence, property, are some of the adjustments, and yet it is a problem of supreme import, and one every home must determine and adjust. In such adjustment, carelessness no less than a misapprehension of the facts involved may lead, as it has so often led, to serious consequences. I propose, further, to recall some of the qualities of water and allow our consideration of the healthfulness of the water supply on our farms from the sanitary problem for our present consideration.

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Pure water is a very simple chemical compound formed by the union of one part by weight of hydrogen gas and eight parts by water of oxygen gas. It is a clear, limpid liquid, devoid of odor or taste. Snow, or a clear rain-water, gives a good idea of its characteristics when in a pure state. But such pure waters are rarely or never met with. Percolations through the soils and rocks abstract from them and dissolve such considerable amounts of soluble matter as to rob the water of its "flat" taste, or rather impart to it the taste of the soluble constituents of the soil or rocks. Hence it is that we have the so-called mineral springs, and the waters of our state are charged so heavily with lime and other soluble matters. This property of water by virtue of which it dissolves different substances, is most interesting and important for our present continued thought.

Very few known compounds can *wholly* resist this dissolving influence of water. Sugar, salt, and many similar articles of daily use yield readily, while others yield only after continued action. Glass itself cannot wholly withstand — 13 parts of glass dissolving in 1,000,000 parts water, and the very rocks under our feet yield, though however slowly, to its dissolving influences. We are accustomed to discriminate between "soluble" and "insoluble" substances. How imperfectly the latter term applies is readily seen from the previous statements. Nevertheless, the use of the term "insoluble" may be retained if we understand in most of the cases "difficultly soluble" as more truly explaining the exact status.

The saline taste of waters is due, therefore, to the obstruction of soluble constituents from the soil through which they filtrate. Fortunate is the man when the soils about his well contain nothing detrimental! Fortunate indeed are we when the harmless alkaline and lime salts form the only soluble constituents of the soil! Nature offers but scattered examples of spring water whose universal constituents are destructive of animal life, and even these as often can be traced to artificial conditions. It holds good, therefore, that soluble impurities and injurious matters must have a local

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origin. The cause of such impurity the sanitary officer must determine and eliminate.

We notice at the very outset that these chemical compounds injurious to, or destructive of animal life, easily soluble in water, possess almost without exception a disagreeble and nauseating taste. Such a safeguard has nature put at the very entrance to the digestive and absorbent systems. It would be idle, therefore, to discuss the danger of fatal poisons in our daily draughts of water. But what of those insidious poisons so often contaminating our well waters, so intimately disseminated through them and in such infinitesimal amounts that no eye can see or tongue taste. This is the question of supreme importance in this discussion. Can we afford to allow on our farms and by our homes, such agents as may through the medium of our wells, injure or destroy! Has it never occurred that the clear sparkling liquid on the table may be conveying disease and possible death to those whom it should benefit, simply through the want of attention and a little personal care? This is not sentiment and theory, but stern actual reality! The records of our villages bear a too terrible witness through the mortality from Diphtheria, Dysentery, Typhoid Fever, and other zymotic diseases if not directly caused, at least aided by the abundance of the impure water supplied. Is it a matter, therefore, of small concern whether we examine and care for the water supply?

CAUSES.

Contamination of waters may arise from two sources:

I. *From inorganic matters or those of a purely mineral origin.*

Most of us are happily unaffected by such a consideration. The causes are confined to localities and districts: *e. g.*, in southern Wisconsin, as is well known, lead and copper salts so permeate many of the natural waters as to render them non-potable, in some districts rain waters being exclusively used for drinking purposes. Similar illustrations of natural waters polluted from sources of similar character may occur to all. Contaminations from mineral sources have therefore but little value for us in this connection.

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I cannot, however, allow this opportunity to pass by without at least filing a protest against the baneful use of lead pipes for conducting waters. It is true that convenience and cost are elements recommending lead for use in such cases. It is true that lead can work but little harm to waters for use merely for cleansing purposes. *But lead should never be used for conducting waters for drinking purposes.* Especially to be deplored is the frequent use of sheet lead for the construction of small house cisterns. And with good reason. Lead compounds are soluble in water. (Even the most insoluble as lead sulphate having a definite rate of solution 1 part: 22,800 parts water). It is true the lead itself is not. But under the influence of air (always dissolved in water) the metallic lead is gradually changed to a soluble compound. Add to this aerated water the results of decay of organic matter — almost always present in waters, and the process of transformation of the lead is hastened with increasing rapidity. I need not add that many an interrogation has been raised as to the influence on the animal economy of the gradual deposition of the white lead formed by this process. Lead compounds of any form or class are extremely poisonous. Even one grain of lead per gallon of water has been certainly demonstrated by Dr. Hoffman to produce chronic lead poisoning, and smaller amounts of this cumulative poison cannot be habitually absorbed with impunity.

II. A second class of contamination is of an organic nature or, *contamination from those compounds found directly through the agency of animal and vegetable life.*

It is from such dangers we have much to expect. These natural organic compounds of such intricate and varying character as almost to defy accurate chemical analysis are as a rule attacked and dissolved by water. The hard, woody fibres and mineral constituents of the plant, the fibrous and bony structures of the animal yield slowly; while on the other hand the softer components of both animal and vegetable and particularly those of an albuminon character yield most readily filtering away with the water to undergo ultimate decomposition and chemical change. It is true soil

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acts as a most powerful absorbent and destroyer of these organic particles and its well-known properties for arresting and retaining the deleterious products of decay need no consideration here. Did the waste from the house, the cesspool, privy vault, and stable but discharge itself on a receptacle where its presence would prove not alone innocuous but of positive advantage our consideration of uncontaminated well-water would prove entirely superfluous. But alas! how often does the opposite hold true! Review for an instant your knowledge of the relative location of well and vault upon the property of your own circle of acquaintance. Recall those instances where hopper and vault are placed within a radius of a few feet from the well and where even the well whence the family and stock alike receive the necessary liquid is by the very posts of the stable and yard! It seems to me that on such a review the point would appear well taken that sufficient discretion has not been shown on our farms in selecting the site for the well.

I can conceive of one condition that would alleviate the possible evils in such a case. All soils do absorb to a greater or lesser degree, the porosity is not annihilated in any case. It is true that though such power of absorption is never annihilated, yet as in the case of clay and similar compact soils the penetration of waters is reduced to a minimum, and the consequent percolation is relatively small. If such a compact stratum should by chance form the superior layer of the soil immediately surrounding the home, and especially if it should possess an incline from the well, the possible evil might be partially or wholly averted. Factors too seldom contributing to such fortunate results.

We have noted that the soil acts as an absorbent and destroyer of organic matter. This is perfectly true, and yet a soil reaches soon a point beyond which it will cease to act as such an oxidizing agent. The reason is obvious. The pores of the soil or interstices between the particles, acting similarly to a large syringe, take up the organic matters together with the air and bring them into such intimate relation that the air can re-act on the organic matter, and by virtue of its oxygen destroy it. Besides performing such a

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purely mechanical office, the soil can, and often does, act directly and chemically on the contained matters." But with these easily oxidizable organic substances are contained particles more slowly and only with extreme difficulty destroyed. These are retained by the soil and having been drawn into the pores in their finely communicated condition, serve to choke the pores, and consequently destroy the oxidizing power of the soil. The sequence of such continued action is obvious. The continued filtration of polluted waters through the soils from a given point will proceed until such conditions are reached as shall destroy the contained deleterious matters. The gradual closing of the nearer surface soils as mentioned leads to the uninterrupted flow of such polluted waters into the surrounding parts, which in turn become surcharged with foreign bodies and cease to act destructively. Hence it is the soils about our cess-pools and vaults become more and more contaminated each advancing year, the pollutions reaching outward on every side as well as downward. The more loose and porous the soil, the more rapid and extended will such pollution prove. It can readily be seen therefore that even on level ground and on ordinary soils this continued action would cause the small vault or pool in a very few years to embrace a relatively large volume of earth, and could in a shorter or longer time include the area of the well. Where the distance between the well and vault or other source of pollution is but a few feet or rods, the probabilities are more than equal, that the well would receive its full share of the filtration and more than the full share, as it would very naturally form an easy outlet for any solutions percolating through the soil, and hence increased flow in that direction would in all probability be induced.

Several important practical questions are suggested by such considerations. What kind of a well shall be used? Where located? At what rate will soil become saturated with foreign matters? What are their effects, etc.?

Leaving particular cases to be decided on their own merits, we must but sum np some of the results of observation. The wells of our state are generally what are known as

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"surface wells," varying in depth from twenty to seventy feet. Such wells, are and ever will be peculiarly liable to contamination. Surface waters produced by violent rains and melting snows only too often gravitate in their direction, sweeping along the surface filth from the yards. The diameter and consequent large interior wall surface, drains a large area of the soil, subject to the percolations described above. "Driven wells," on the other hand, are not open to so powerful objections. The first of these contaminating elements is completely removed, and the probability of percolations "following down" the pipe reduced to a minimum. As a simple matter of observation, I have noticed that, in my own chemical analyses, waters from driven wells have been as a a rule, superior to those of any other class, save expensive artesian wells, for drinking purposes. The relatively greater depth of the well and the difficulty of access of organic matters are certainly two important factors contributing to such a result.

As regards diffusion through the soil no rule can be accepted. It is computed that the area drained by a well may be measured by a circle of which the radius is four times the depth. To show how incompletely such a limited filtration always satisfies the actual conditions, and that filtration through a soil may be from a greater distance without involving the oxidation and destruction of the dissolved organic substances, there can be cited the well known case in the town of Lausanne, in Switzerland, "where the dejections from typhoid fever patients were thrown into a running brook irrigating a meadow filtered through a *mile* of earth, and reappearing as a spring below, from which the people of a town drank." *

The appearance of the typhoid fever in the latter case striking down seventeen per cent. of the inhabitants, was almost conclusive proof of the filtration through even that distance, unchanged, of the dangerous organic compounds.

We cannot therefore rest content on the supposition that our own wells are safe from all pollutions. "Eternal vigilance is the price of safety." On new surfaces, with even

* These Tran-actions, 1876-77, p. 288,

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short distances intervening between well and possible sources for water pollution, pure water may be for limited periods obtained; but just when purity ceases and contamination begins cannot be pre-determined. Careful consideration of the soil, distances, and climatic changes must all lend their significance in deciding the question whether such a condition in any particular locality may come within a few months or a series of years. Certain it is that matter, whether organic or inorganic, is indestructible. It may be *changed*, but never *destroyed*. It is therefore the very essence of good sense to inquire carefully and thoroughly where this continued deposition of organic and harmful matters near our sources of water supply may tend, and what may be the possible and probable results.

EFFECTS.

In answering completely the question as to the effects of water pollution we tread too far beyond our province and usurp the office of the family physician. The discussion would carry us quite beyond the present space and allowed time. It is, however, pertinent to allude at least to one feature, and probably the most important, of present physiological research, because of its direct bearing on our knowledge of water pollution. I refer to the investigations bearing on transmission of disease by particular animal creations or germs.

We have emphasized the pollution of water by organic matter. Such organic matters may be merely aggregates of inanimate or "dead" matter, but the microscope no less frequently evidences that these masses of organic material are endowed with life. The waters from stagnant ponds particularly, and from running brooks and shallow wells, all too frequently are demonstrated to swarm with myriads of these organisms.

The study of the evil results from usage of foods in any stage of putrefaction, is as old as the science of medicine itself. But only within the last twenty years has the study of transmission of disease by germinal spores assumed any marked advance.

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The study of splenic fever in cattle, for example, has clearly demonstrated that this fatal disease is caused directly through the agency of microscopical organisms. The investigations of Pasteur have eliminated the particular *bacillus anthracis* producing the disease. His classical researches at Melun, carried out in the presence of 200 stock-breeders of France, so surely demonstrated the cause of the disease and the preventive by vaccination, that in 1883 no less than 300,000 cattle had been vaccinated against the splenic fever germ in France alone. That similar germs produce their peculiar diseases has been clearly demonstrated in the identification and diagnosis of the germs of diphtheria, syphilis, consumption, chicken and hog cholera. The contest now raging over the particular germinal cause of Asiatic cholera attest the hold the germ theory of disease has attained in the minds of medical men.

The bearing of this mere reference to so important a field for present research is of significance to us in our discussion of pure well water. That such fatal germs are certainly transmitted by well water there can be but little reasonable doubt. There is no need of going beyond the boundaries of our own state for the proof. Extracts from reports to our state board of health cry out against the evil results from use of impure water. Excerpts from reports to other state boards studied for their bearing on this particular point, show almost without exception that dysentery and typhoid fever were directly traceable to the bad water, and that diphtheria, if not directly caused by it, was surely aggravated in houses using drinking water polluted by organic matter. The fearful ravages of these prevalent diseases so directly the off-spring of imperfect sanitation may, with good cause, draw attention to the condition of our wells.

The examination of the whole question as to zymotic diseases in animals is waived for the present, though in our present light it could hardly fail to be of great value for us to thoroughly discuss in its relation to the necessity for pure water for the stock. Too often a stagnant pool or pond is the only source for drinking water. We can hardly question the validity of the statement that the poor health of the

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life "at the barn" can be undoubtedly as directly traced to the impure water supply as we have certainly found to be indisputably the case with the life "at the house."

THE REMEDY.

The study of result has ever stimulated energetic inquiry as to cause, and if such causes effect disastrous results increased exertion for their counteraction and removal. Happily in our consideration of the oft fatal results from contaminated water supplies, we are not left ignorant of the causes, nor has the study of the causes contributed nothing to remedy the evils. We have seen that water from wells once pure and healthful have, by the admixture and absorption of substances from organic processes, in turn become injurious and even destructive to the animal economy. In the Transactions of this Society for 1877–78, pp. 286–315, or in the annual report of the State Board of Health for Wisconsin for 1877, pp. 62–91 will be found detailed accounts of investigations concerning the actual condition of drinking waters of this state as carried out by Dr. G. F. Witter and Mr. Thomas Chittenden of Grand Rapids. Too great stress cannot be laid on the significance of these reports. But it is not for us to idly read and pass them by. These facts and figures are founded upon data from observations on our own town and country homes. A few simple observances are all that is required to ward off the possible evils thus threatening our country life.

The waste from the house should never be thrown on the surface in the immediate vicinity of the well. Such waste waters and slops should always be carried in pails to the proper distance, winter as well as summer, or better, a cesspool dug at a suitable distance at slight cost, can receive the waste through a properly constructed drain. This "suitable distance" must be carefully determined. Dr. French, of Concord, in the Fourth Annual Report of the State Board of Health, for Massachusetts, tells of a case "where on property used but three years the well water became unfit for use, the soil was of a loose character and it was demonstrated that even in this short time the well had become con-

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taminated through the infiltration from the sink-spout forty feet away." Six or eight rods is the least distance safety would as a rule select, but in light, porous soils even this distance would be safe only for a limited number of years.

No privy vault should ever be allowed within a radius of one hundred feet of the well. A nearer approach is at the peril of safety. If the present distance is less than four rods the vault should be removed to a greater distance and safer point at once. A case occurs to mind, in one of our towns where a household numbering, including boarders, always over thirty, obtained its sole supply of water from a well situated within *five feet* of the single vault, reeking with filth. The well was justly ordered closed by the sanitary official amid the loud denunciations of the proprietor!

Such a case is indeed startling, yet on how many of our broad farms is the radius but five or six times the distance at the most!

The same conclusions obtain in the pollutions arising from stable and yard. The "barn well" is a poor servant at best. It is an utter impossibility for its waters to remain uncorrupted by the abundant effluria covering the surrounding surfaces. As already intimated the question whether its continued use proves either actually or potentially detrimental to the stock is one well awakened by our present discussion; but one for the student of veterinary science to investigate and declare. But for our present purpose at least as it is demonstrated that waters containing any organic matters are to be avoided for personal use the waters from the *barn well* are to be regarded with utmost suspicion.

The waters from such contaminous wells may or may not give an odor or have a suspicious taste. In fact, the contrary is as often true — the products of decomposition imparting a "liveliness" to the waters rendering them notorious for their agreeable characteristics! The clearness and limpidity are no index of its character. The clearest water may transport the most fatal germs. Have we then any simple means for determining the purity or impurity of our drinking water, and its safety for common use? The two senses smell and taste are quick to detect a wrong condition, and

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any waters possessing in any degree a bad odor or taste should be examined at once by the family physician or sanitary officer. For the the examination of waters not possessing any such peculiarity, I will enter two simple and inexpensive methods capable of being carried out at home.

I. "Heisch's Test for organic water," recommended by the Wisconsin State Board of Health.

"Filter through filter paper, flannel or some similar material into a clean, clear glass jar from ½–1 pint of water to be examined. Add pure cane sugar in the proportion of 25–40 grains (say ½ teaspoonful to 1 pint,) cork or cover to prevent the entrance of any extraneous material and set aside in a warm place from 70° F. upwards for 48 hours. At the end of that time observe whether any milkiness, opacity or bad odor has become perceptible. Water sufficiently pure for drinking should be clear and transparent and free from all odor at the end of 48 hours."

II. Recommended by the Indiana State Board of Health.

"Dissolve a grain of Potassium Pennanganate in an ounce of *distilled* water, fill another *clean* ounce vial with the suspected water. To the latter by means of a minim drop tube (to be obtained from any druggist) add one minim of the pennanganate solution. If the water soon becomes colorless, add another minim and await the disappearance of color, repeat until the faint red color is no longer discharged. *A sample of water which will decompose two minims of pennanganate solution is unfit for use.*"

Everyone can thus readily satisfy themselves of the character of their own well water. If either of these tests shows presence of organic matter, lose no time in consulting with the family physician before further usage of the waters. Delay is dangerous.

To sum up, then, our conclusions concerning the supply of water on our farms. We are certainly confronted with an evil. On the broad acres of the farm, where nature apparently offers every premium for good health and healthful surroundings, are certainly found conditions imposed by carelessness and disregard of her requirements, assisting, if not directly causing disease and death. A glance at our

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own buildings will too often attest this truth. Under our present light it needs no skilled eye of physician or sanitary officer to determine this fact, and the purpose of this paper will have been amply fulfilled if such attention may be directed as may lead to an investigation and critical questioning as to the condition of our water supply. So disastrous do the events frequently prove, and so common are the evils directly traceable to polluted waters, it is very evident that it is the office of every fair-minded property holder to investigate the condition and attempt the satisfactory and imperative solution of the *sanitary problem* on his own possessions. The methods given above, so simple, so complete, and so inexpressive, can be, with little trouble, applied once every six months, to determine the purity of the drinking waters. The increased exertion to prevent the pollution of the soil within a safe distance of the well, and the elimination thereby of the prime cause of the evils will most assuredly meet its reward in the certain freedom of our homes from the entrance of disease through the avenue of the well, and the satisfying of one important demand of the annual economy through the abundance of good, wholesome, healthful and health-giving waters.

Mr. Hoard—I want to add two facts to the very able and interesting essay that the Professor has read. In 1874 diphtheria entered my family. Before we were through with it there were seven cases. At one time I had five cases of diphtheria. My oldest son, who never has recovered from the terrible effects of the disease, was fifty-nine days prostrated with it. I found on investigation that the origin of it was the water of my well, and there was not a privy sink within five rods of it. I applied a test and discovered that the well was rank poison. I would not go through such a siege again for all the wells there are in Christendom. It is a terrible disease. It is a blood poison. It is induced by this very cause, in a very large majority of instances. It is hard to make men believe that a well, the lowest water level, is the absolute drainage of all the territory about; it is. Now

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to show you just how far it will take this poisonous matter from the sink, the state board of health of Massachusetts examined three hundred wells, and they found by following from the sink to the well, in the discoloration of the soil, tracing it clearly, they found in some instances that the well had drained directly from the vault as high as eight rods. I mention those two facts coupled with another, which applies to my own practice in business; a large proportion of all the loss in butter and cheese in Wisconsin and every other state comes from the impure water that the cattle drink. I believe to-day that these thirty million pounds of cheese in Wisconsin could be on an average enhanced from one half to one cent a pound, providing every farmer would resolutely fence his cattle away from sink holes and only give them pure water, oblige them to drink it. I saw last summer in the county of Jefferson a farm that contained forty cows, and the only water supply that those cows had was a sink hole where they stood in it knee deep, and muddy and filled with filth. I expostulated with the owner, and he said the cows would drink it in preference to well water. "Why," I said, "The reason of it is that it is warm." Cows will drink impure water if it is warm in preference to cold well water. It seems as though the terrible effects of disease, and the great cost of property and everything else ought to make this subject very pertinent to every farmer.

Mr. Hinton—One of the great dangers is to concentrate the mind upon one line of thought, losing others. I do not doubt the Professor's ability, nor do I question any of his processes. I sympathize with my friend Hoard, but I remember very well at Rock Hill, where six children and the mother were swept out of sight with diphtheria, there was not a well within five miles of it, nor a healthier spot on God's earth. I remember well that when the epizootic epidemic was coming up from the south, S. B. Davis, of Milwaukee, had two very valuable colts, and the question came up, could he save them. He sent them out into a field two miles away from any other horse with simply a spring, and both of them were found dead there with it. The thing is, the air conveys disease as much as water. Nobody for a moment

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questions the necessity of pure water, but if the gentleman's theory is carried out, and I think I would be strongly in favor of it, particularly because I am in favor of protection to home labor, I think every farmer would require a chemist on his farm to look after the water. I simply say this, here is a historical fact well known. You well remember the plague that swept terribly through Europe. It died out. It died out in spite of all scientists. These diseases die out for want of air, nutriment, or something to convey them. Some students were disputing about it in the city of Sprague. They got to drinking. One of them said, "I never was afraid of it; let us look into it; in that cupboard is where they put away the bandages." They took the poker and broke open the cupboard. The plague began to spread, and it was more terribly destructive by ten times than it was before. What had water got to do with that? If this drainage theory is so, I want to ask the Professor one question. Did you ever hear of a grave digger that was not a long-lived man? Tell me of one. Did you ever hear of a man hurt by drinking well water in a cemetery. Is it not a fact that those who live in the abbatoirs outside of Paris, and those who in London gathered up dead horses, and the butchers, were free from cholera? Not a solitary case of cholera was known among them. That is well authenticated. You can send these ladies and gentlemen home and they won't sleep nights for fear some one has got a well.

Mr. Hoard — Do you want men to drink such water?

Mr. Hinton — No. But do not confine it to the idea of wells. The gentleman has shown, himself, that percolating through the earth for a mile the water was so impure that it killed a Swiss village, or something of that kind. The whole earth is an absorbant. The earth is a common filterer of everything. We know the mists that rise from the sea and are gathered up on the mountain tops descend and pass through the earth, and while everybody wants pure water, and knows very well that impure water is deleterious to health, yet I think this theory of lead pipe does not amount to a row of pins, except the water is left stagnant in the pipe. Whoever heard of a plumber dying from sewer gas?

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I went around and questioned every one of them in Milwaukee.

Prof. Smith — The son of a prominent chemist in New York died with sewer gas.

Mr. Hinton — I do not wonder that a scientific man died with it, but a practical man would not.

Prof. Smith — He was a plumber also.

Mr. Hinton — He was not fit for his business. The two toughest men in Milwaukee are plumbers. One gets sixty cents an hour for working, and the other gets sixty cents for looking on. I do not agree with Brother Hoard about his cattle. I admit that cattle may go when very thirsty to a wrong place to drink, but some how or other he who implanted in man that great faculty, which our friend possesses, of good story-telling, has implanted in the animal something which we cannot define, which tells him that this and that will injure him if he takes it. In spite of all this theory mankind are living longer to-day, and living better, than they ever did before.

Mr. Hoard — That is from better education.

Mr. Hinton — In the city of Brooklyn the handsome buildings that crowned the heights were full of diphtheria, when the low places escaped. When you come down to it, you will find that some of these old sayings are very true. If I was taken sick to-night, or any of my family, I would send for a good doctor at once. But let me tell you that what was said long before any of you were born, or your grandfathers either, is true, that doctors put drugs of which they know little into bodies of which they know less. The other day a woman by mistake gave her child a mixture of corrosive sublimate which she happened to have ready to kill insects, and it cured the diphtheria, and doctors to-day are using it. I know what it is to have suffered from diphtheria, and I sympathize with my friend here. I am not speaking of this thing lightly, but there are others here whose households have been draped in mourning from that dreadful disease, and it seems that the only solvent discovered, and that seems to have been reached by accident at last, is that terrible corrosive sublimate. Any gentleman familiar with

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chemistry will tell you that an accident saved the life of a man who was on trial for poisoning. It was proved that a man had taken a dose of calomel. It was proved afterwards that in his burning thirst he got up and took a draught of salt and water from a cup on the table, and that inside it had formed corrosive sublimate. His brother was on trial for poisoning him, because he was the only heir to the estate, when the servant revealed the fact that, hearing a noise, she opened the door and saw the man drink this, and it was shown that putting a little of this into a tumbler would form the compound that caused his death. I did not get up here to make a speech, but I tell you the effect of such a paper is to throw fright and fear and everything of that kind. There is not a paper in the United States to-day that is not cursing the sugar makers for adulterating sugar, and you might as well look for the grace of God on the hills of Scotland as to look for a pure piece of sugar anywhere. You cannot get it. And I tell you, the more scientific men we have, the less knowledge we get. I mean nothing personal to my young friend here. I hope he does not think so. This is what I mean, the effect of such a paper is to create fright, and not to do good. That is why I attack it.

A motion was here put and carried, that speakers be confined to five minutes, and that no one shall speak twice on the same subject without the unanimous consent of the convention.

OUR COUNTRY ROADS.

By J. C. FORD, of Madison.

A road, in the modern use of the word, is an open way or passage from town to town for public travel, by means mainly of wheeled vehicles. The savage has no roads and needs none. He is a migratory being, and his home is where night finds him; the pursuit of game and of his enemies his occupation, and neither are apt to follow well-beaten roads. The semi-civilized man, living a pastoral life, needs no more

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than a path; he has no towns and no commerce, and follows and dwells with his flocks and herds.

It is only when man locates himself and begins to cultivate the soil, that he finds the need of roads. He must then protect his crops from the trampling of man and beast, aud he must commit no similar trespass on his neighbor. But as he must have some way of egress and ingress, and as he needs to barter a part of what he raises for necessaries which he does not raise, he must have some common way over which all have a right to travel to the central point where his bartering is carried on. This need gives rise to the road, and as civilization — which has now commenced — increases, a greater variety of products is raised, and commerce, therefore, increases. This calls for more travel, and this in turn calls for special attention to the roads over and by which this commerce is carried on. In point of time, however, the military road usually precedes the road of commerce. The king's highway is a first necessity to protect his dominions against foreign invasion and domestic insurrection. He must have means of transporting his troops by the shortest and quickest way to the point of danger. It was this necessity that caused those great Roman roads to be built remains of which we find in England and in Italy, and some of which, after a period of two thousand years, remain almost as perfect as when first built.

But these roads are soon utilized for commercial purposes and become one of the greatest factors in the nation's progress. The great road which Napoleon built over the Alps into Italy is by no means the least useful of his works and stands to-day a prouder monument to his memory than Austerlitz or Waterloo. The old "National Road" built early in this century by our own national government stimulated and hastened in a great degree the settlement of the western country, and is a reminder of the sagacity and statesmanship of Henry Clay. And much as has been said against the prodigality and corruption of our great railroad land grants, it cannot be doubted that the building of our three great Pacific railroads has been worth to us all they have cost.

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I cannot help thinking that in America the farmers as a class, greatly undervalue the importance of our roads as means of progress both material and moral. Country life is largely individual. The farmer for the larger part of the year occupied with business on the farm forgets or overlooks the importance of bartering ideas as well as products with his neighbors. That the roads are impassible for six months in the year concerns him not. It is in the fall, spring and winter that this occurs, and he thinks he has enough to do in feeding and caring for his stock to keep him at home. If others wish to use the roads let them make them. It will be time enough to market his produce when the roads have become dry and hard. He forgets that it is just the time when he cannot work on the farm, that he needs the roads, and to take advantage of the markets.

As for social intercourse with his neighbors he thinks but little of that. The bright, cheery fire-side of his neighbor; the evenings spent in pleasant social intercourse; the interchange of ideas and experience from which so much advantage might be got; the relief to wife and young folks; the community of feeling and interest thereby created; these are all unknown to him. Through the long dreary days and months of impassible roads he and his family are compelled to live by themselves. Then too the material loss which he suffers, he little thinks of or appreciates. It is precisely during the period when the country roads are worst, that he has the leisure from farm work to do his teaming; drawing his grain and other products to market, and his fuel and seed and whatever else he may need on the farm or his home.

When the natural road is good, he must he busy on the farm, putting in and caring for his crops.

Does our farmer trouble himself to learn the difference in cash to him, during the year, between a long road and a short one, a hard road-bed and a soft one, a smooth track and a rough one, a level grade and a steep incline? I think not. And yet those who have given the subject the most careful study have come to one conclusion, and that is, that

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the most direct road feasible, the hardest, smoothest road-bed, and the easiest grades, all taken with relation to each other, are economical in the long run, and that for main travelled roads the expense necessary to the construction of such roads is a secondary consideration. Of what importance (comparatively speaking), was the expense of the Alpian way, considering the service it has rendered and the length of time it has endured; or the Peruvian road, of 3,000 miles in length, the foundations of which, after unknown centuries, are so solid and compact that only gunpowder or dynamite will dislodge them?

And what have we in this country to set against these roads built by people of whom we think as semi-barbarians? We, the foremost people, as we think, of all time! How have we met this question, and how has our money and time been expended in this direction? We shall see presently.

But in estimating the value of good roads, let the farmer consider once what sharp sighted eastern capitalists have thought and done in this direction during the last forty years in this country.

On the 31st day of December, A. D. 1883 (I quote from Voor's railroad manual), there were completed and in operation in the United States, 121,295 miles of railroad, the actual cost of which, including equipment, he estimates at $3,787,410,728. The total stock and liabilities of said roads he puts at $7,495,471,311. On this latter sum dividends are sought. On the actual cost Voor estimates these roads to pay about 9 per cent. dividends. The average cost per mile of said roads, including equipment, was $62,176. The gross earnings of said roads for the year ending December 31, 1883, were $823,772,924. The freight earnings were $549,756,695.

And what have these immense sums been expended for by these eastern capitalists? Why to get your freights and haul them at least cost to themselves, so that they may get dividends on this outlay of over $60,000 to the mile for a road. Do you think they know their business? Dividends of 9 per cent. on cost, after all expense of running these roads is

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deducted would seem to show it. They have proved to be the most profitable investments ever made on a large scale.

In our own state there had been built up to December 31, 1884, 4,267.95 miles of railroad, the total cost of which is put at $162,936,363.40. And the average cost per mile, including equipment, is $40,436.35. The tonnage for the year on the roads in this state is put at 4,670,201 tons. The total income of Wisconsin lines for the year 1884, is put at $21,120,871.54; of which, for freight alone, $13,732,837.67. The average cost per ton per mile is given by the companies at 1 44-100 cents.

Think of it, farmers. You have paid these roads during the year for doing your freighting nearly fourteen million dollars. It has been done over roads that cost these eastern capitalists over forty thousand dollars a mile. And yet it has been done at a rate of $1.22 per ton from Madison to Milwaukee — a distance of 85 miles. Could you compete with these rates with your teams over our country roads? I think not. There are in Dane county alone about 140 miles of railroad, which at the average cost per mile given for Wisconsin roads would amount to $5,661,089 spent in this county merely in preparing a road-bed and machinery to move your freight. The cost of running this machinery, and repairs of stock and track, must be added to this.

What would the supervisors of Dane county, or the voters have said, had they been asked to appropriate such a sum for roads and wagons to carry their produce to market? But what has been expended in this county has been expended in equal proportion in the other counties of the state and nation; and all to do your freighting and to carry you whither you would go.

I have presented this array of figures to show you the value which sagacious men, not living in our state, have placed on these improved means of transportation; and also to show you that the enormous outlay of money has been abundantly justified by the dividends they have received, and that at the same time you have been greatly benefited by their cheap transportation.

This vast outlay for railroads has undoubtedly doubled, perhaps trebled, the value of the real estate in the United

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States. It has made possible great inland cities and so has been building up for us home markets which in turn give value to anything which you produce.

But great as their value has been to us, I think it a misfortune after all that the railroad came so soon. England and the continental nations of Europe had inaugurated and perfected a system of admirably built stone roads before the locomotive was invented. England had secured over 25,000 miles of these roads (mostly McAdam) early in this century, the cost of building them having been defrayed, the cost of keeping them in repair is not great, and now at all seasons of the year the roads can be, and are used, and loads that would astonish an American are constantly passing over them. These roads add largely to the attractiveness of the country and to the value of the real estate.

The cheapness with which freights are carried on our railroads suggests the value of hard, smooth and level surfaces in diminishing traction, and the heavy loads drawn on stone roads show the same thing. But in order to get more definite knowledge on this subject the dynamometer has been put to service with the following results: (I quote from John J. Thomas's work on "Farm Implements and Machinery," page 85):

"On a new *gravel* road a horse will draw eight times as much as the force applied; that is if he exerts a force equal to one hundred and twenty-five pounds, he will draw *one half a ton* on such a road including the weight of the wagon; the *road being perfectly level.* On a common road of sand and gravel sixteen times as much, or *one ton.*

"On the best hard-earth road twenty-five times as much, or one and one half tons.

"On a common broken-stone road twenty-five to thirty times as much, or one and one half to two and one quarter tons.

"On the best broken stone road fifty to sixty-seven times, or three to four tons.

"On a common plank road covered thinly with sand or earth, thirty to thirty-five times as much, or about two tons.

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"On the smoothest *oak plank road* seventy to one hundred times as much, or four and one half to six tons.

"On a *highly finished* stone track-way one hundred and seventy times as much or *ten and one half* tons.

"On the best railroad two hundred and eighty times as much, or *seventeen and one half tons.*"

Here we see the immense advantage of the iron rail over all other roads, and next to that the *thoroughly finished* stone track. The foregoing tests all apply to *level* surfaces. In case of elevations or hills, the extra power needed to haul the load on the hill is the power necessary to lift the weight the number of vertical feet, reckoned from the base to the summit. On a grade of one foot to ten, the horse lifts one tenth the load in addition to the power needed to draw the load on a level, and in like proportion for all degrees of elevation. On all but the hardest and smoothest surfaces the character of the wheel in size and width of tire would affect the problem. In soft and uneven surfaces, the large wheel and the wide tire presenting least resistance to overcome.

I have gone somewhat extensively into statistics of railroads, and have given results of experiments with the dynomometer, on hard and soft roads, and on inclines, to show more convincingly the value of good roads, and the vastly increased power obtained by the use of them, and on the contrary the loss of power and vastly increased expense of poor roads.

And now what is *our* condition in this regard after over forty years of settlement of the state?

Are we abreast of the times, and have we shown by our works that we properly appreciate the subject. It has fallen to my lot during the last quarter of a century to frequently traverse nearly all the principal roads in this county. By stumps and stones; by sink-holes and washouts; by marsh and steep hills; and by broken buggies and tired and lamed horses I have been compelled to notice their character and can speak feelingly of their defects.

In its topography the county is an epitome of the state. We have here openings, prairies, hills, valleys, marshes,

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lakes and streams; and we have also the different qualities of soil which accompany such a condition, together with sand, boulder, and quarry stone. And I therefore assume that what we find here in the natural condition of our roads and the means of their repair, exists elsewhere in the state. In territorial times the roads were good. First, because the travel was much less than at present; and secondly, because the roads were not then fenced, and the traveling public had the broad domain over which to pick its way. The old prairie sod with centuries of weaving and interlacing of fibre had become a tough matting on which the wheels rolled as smoothly, and more noiselessly than on the Nicholson pavement. But as the country became settled the travel increased, and the roads being fenced the wear of wheel and hoof soon destroyed this natural pavement and down we went into the soft soil below, and there for the most part we have been ever since.

As a consequence of the reign of the district pathmaster and his experiments in subsoiling the roads, in order to raise his annual crop of weeds, we have at the end of his 40 year reign, a highway the only solid parts of which are the places where he and his assistants have rested, as they lay under the trees and worked the roads at $3.50 per day, with "Old Sledge" and similar utensils.

Instances of the bad condition of our roads, and of the utterly worthless way in which they have been worked might be given without number. I will only cite a few as specimens.

In a road on which I have traveled in this county many times, and at a place where only one track the width of a wagon was cleared on the one side, and that the upper, directly where the wheel must pass over it lay a boulder half imbedded in the soil. Every loaded wagon that passed over that road must lift its wheel over that rock, a foot or more in height, grinding and frequently wrecking the wagon and vexing the team. There it lay during over thirty years of frequent travel, and yet one half hour of the pathmaster with a crowbar would have moved it out of the track and out of the way. Just below the hill where this rock lay the

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road passed over a stretch of low, soft ground. Annually that soft ground was plowed and piled up in the center of the track, and lest passengers might choose to pass on the smooth sod on the side of the track, that was plowed also. Just above on that hill was plenty of hard earth and gravel, which could have been placed on this soft earth by a few rods hauling, and both parts of the road thereby benefited, but it was never thought of.

Another road I have in mind in this county near a town and station. The road is laid along the section line. To follow that line it must pass a hill of at least forty feet in height. This hill is circular at the base, and therefore like the bale of a kettle, as far around and no farther, as over its crest. Over this short, steep road all the heavy loads going to and from that town and station must pass, and have passed for all the years since the country has been inclosed, and why? To gratify the mathematical eye of the chairman of the town board, or perhaps to favor the individual owner of the premises, or possibly to save the few additional dollars a road would have cost around the base of that hill.

Another instance of the pathmaster's wisdom might be given. In the northern part of the county are a number of ridges of gravel which the highways cut at nearly right angles. The surface has been removed for a depth of three feet, more or less, thus exposing the material of which the ridges are composed. And yet for years the traveler has been compelled to climb those steep acclivities, and on the prairie road on either side travel through the plowed ground which has regularly been turned over to *improve* the road.

Another instance will show the disregard of *distance* and *grade* by the authorities in locating the road. A public road not far from Madison, and one which is as much traveled as any leading to this city, and one which has been traveled from the earliest settlement of the county, over forty years, ran diagonally to the section line, along the base of a hill, and with the section lines forming the hypothenuse of a triangle. The owner of the farm through which the road ran desired to change the road so that it should follow the

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section lines, and thus enable him to get together in a more convenient shape a small quantity of poor land. The board, acting, as we are bound to believe, from a high sense of public duty, granted the owner's petition, relaid the road along the section line and over a high hill, and in the work of relocating and working the road, put the town to great expense. And now all the travel and loaded wagons must climb that hill, taking the two sides of the triangle rather than keep the old, level and short route. Was this for the public good? Did the supervisors properly estimate the loss and damage to the public from the change, in compelling the horses, for all the years to come, to lift those heavy loads over that steep hill? I think they knew little about their business. Most of these mistakes have come from the idea that the individual interest is of more consequence than the public, and that the symmetry of one man's fields is of more consequence than the need of all the public for a short and level road.

And now after 40 years of taxation for road purposes, I do not know of a road in the county over which for a distance of five consecutive miles, one could at all seasons of the year, ride with ease or draw heavy loads. And what have we expended on roads during this period? I can give the returns made by the several towns in this county during the ten years ending in 1884, and I find there has been expended during that time (not including the city of Madison) the sum of $573,880.64. This sum should be increased by the taxes levied in four towns for one year and which are not included in the above returns. This would raise the amount to at least $580,000. If to this be added the taxes raised in the city of Madison for the same period, being $92,654.90, and we have a gross sum of $672,654.90, expended in this county alone during the past ten years, or an average of $67,265.49 per annum. The equivalent we have received for this great sum is the roads I have partially described.

And why should this state of things exist? Do we lack the material for good roads? No. This county and the state are full of good rock and gravel. We have scattered over the surface abundance of boulders of the hardest rock, and

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which crushed would make the best of road metal. We have also granite quarries, which we are sending out of the state to build roads for other people. Do we lack the *means* to build good roads? No. For the money which has been squandered in this county during the last ten years in this direction would have built of good McAdam road on a solid bed, with a track 18 feet wide, and a thickness of broken stone averaging 9 inches, including proper drainage and culverts, not far from one hundred miles of road. If made of gravel probable double that amount. These roads so built, with a small sum expended annually to keep them in repair, would last for all time. But, since the railroad has come, do we *need* these roads? Yes, but not so many of them, or rather, not for such long stretches as formerly. I would have the main roads leading to the principal towns in the county and to the railway stations, built of stone or gravel of the most substantial character, the work to be superintended by a competent person, and carried out according to the plans furnished by an experienced civil engineer. In some cases, where difficulty may be found in getting a foundation for a stone or gravel road, it might be found economical to build tramways, whose track should be adapted to the common farm wagon. The rail should be broad and flat, with flange so that the vehicle would follow the track the same as the street-car. On such roads only a narrow track for the horses would need to be paved. And such a road could be built as cheaply, I presume, as a stone road. Very heavy loads could be drawn on these iron rails as we have seen. Carriages would follow them equally well. It is not impossible that this may come in time to be the farmers' home railroad.

But we shall never get these roads until our present road system is changed by the law-making power. Nor until our intelligent pathmaster is interred, and our town boards deprived of the power of dividing a town into a dozen or more road districts, each under a different pathmaster, each with different plans, by different methods. It may be doubted whether it is wise to have the power of laying out public roads. Even with the town board, local and conflicting in-

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terests of different towns would often prevent or thwart the interest of the public at large. And this is what should first be considered. Might it not be wise, either for the people to elect three road commissioners for the county at large, or for such commissioners to be chosen by the county board out of their own number, and in that case a county superintendent of streets be elected whose duty it should be to superintend the construction of all roads ordered by the commissioners. These commissioners to have exclusive jurisdiction of the altering, laying out and repair of all thoroughfares. In case of a work to be entered on, the expense of which should exceed a certain sum, let the commissioners be required to first have a vote of the people of the county on the proposition. In all subsidiary and purely local roads, let it be left to the town board. Let the whole taxable property of the county defray the expense of construction of all roads, except such as are purely local, and which only affect the people of one town. In that case let that town bear the burden.

These are only suggestions; I will not answer for the wisdom of them. I have endeavored to impress on your minds the great need of a reform in our system and practice of road making. If I have succeeded in that I am content, and shall leave the subject fully confident that the farmers of the state will bring about any reform in the state which they may agree that they need, and that they will devise the best methods of accomplishing that end.

Mr. B. S. Hoxie — I wish to thank Mr. Ford for presenting this paper this morning. It is a subject which every man who travels the roads in the state is interested in, a subject to which I have called the attention of the farmers through several of our papers for the past two years. Perhaps some of you who read the *Western Farmer* read an article from my pen in last week's issue. I have the promise of a hearing with the chairman of the committee on roads and bridges, and I hope the members of the legislature this winter will introduce a bill revising the whole matter of the construction

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of bridges and roads in our state. It has got to be almost an intolerable nuisance, as Mr. Ford has pointed out, and every man is interested in this. A gentleman who was a member of the legislature two years ago, I think, said to me last evening, "this matter was talked over somewhat by the members of the legislature, and to a man, every one of the members were in favor of some remedial of our road system, and yet not one of them seemed to dare to introduce a bill, because it was unpopular or something of that kind." I hope that plea will not prevail this winter, but that a bill will be introduced making a thorough revision of the whole matter of constructing roads. My own experience is somewhat similar to Mr. Ford's in this matter.

I remember and call to mind one particular nuisance of a mud hole within about a mile and a half of the village of Edgerton in Rock county, and I was told by a man who traveled the roads every day in the week that that was the only mud hole within ten miles on any road leading out and into the village of Edgerton, and that could be avoided with perhaps one day's work with a team and scraper, because there was a most excellent gravel hill on either side of it. Hundreds and thousands of such instances can be found throughout the state, which, for the lack of a system, we have to endure, and it is a matter of money with every farmer and every person who has to travel the road or draw loads over the road; his time is worth something and ought to be counted. I know, and the farmer's tell me, that the time provided for them to work out their tax is time that is wanted on their farms. It is true that just after corn planting there might be a day or two that the boys might go fishing, but they must go and work on the road. I know of two road districts in the town in which I have lived for the last thirty years that for years the pathmasters in those districts never worked out one single dollar of the tax on their roads. How did they avoid it? In some cases, they would make their returns to the board of supervisors, but the law was not enforced.

Prof. Wright, of the State Board of Charities and Reforms: I suppose that we all agree as to the bad character of many

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of our roads at the bad seasons of the year. In fact many of our roads would be better if the pathmaster let them entirely alone and did not work them, and very likely in the town this gentleman spoke of it was the best thing for the roads for the pathmaster not to touch them. I have traveled roads where I have inwardly cursed the pathmaster of the town for doing anything. If they had let the roads alone they would have been good roads, but they had to do something to carry out the duties of their office; but as for the methods of making good roads, while we are agreed on that, it seems to me the remedy is the one thing we ought to consider now. Two difficulties have been noticed by Mr. Ford in his paper. One is the fact that our system of railroads has extended so rapidly that it has done away with the need of transportation for long distances. At a time when we needed to haul grain from this portion of the state to Milwaukee in order to have a market, it was necessary to build a plank road from Milwaukee, and other roads would undoubtedly have been built very soon, but the railroad came and prevented the building of them, under the idea that we could get along in some way, as we have done, without the improved country road. Another reason is the intolerable subdivision of pathmaster districts under our system of local self-government run into the ground. It seems to me that working out the road-tax is one of the things that needs to be abolished. It seems to me that in order to get at any good system of country roads we must do at least two things. We must absolutely abolish all this working out of the road tax and have the road tax paid in money. A much less nominal sum in money paid would secure a much greater amount of work actually. I have worked on the road a good many times, and know how it is. Such work could be put in at times when it would pay best, and not at the time when it was easiest for the farmer to do it. That is another very important consideration. The system of pathmasters ought also to be entirely abolished, and the roads put directly in charge of the town board, or some such board as Mr. Ford has spoken of.

Our present system of state roads, county roads and town

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roads, without any other modification than simply to abolish the working out of road taxes, and abolishing the pathmaster districts, would nearly accomplish the results, and give an opportunity for roads to be made upon some sort of system, but that would still leave us with as many different systems and as many different ideas as there are town boards, or, in case of county roads, as there are county boards, as Mr. Ford suggested. I wish to add another suggestion to that, and that is that the whole matter of roads should be added to the supervision of the railroad commissioner; that he be made commissioner of railroads and highways, with simply the same supervisory authority over the highways that he now has over the railroads. He has no power to dictate the methods of their construction, but he would have power to furnish information, gather information and stir up public opinion, and organize official action, in such a way as would make it very effective indeed. I believe that just that simple change of making the railroad commissioner also commissioner of highways, or call him commissioner of railroads and highways, or commissioner of transportation, which would be right in harmony with our system of self-government, leaving the right to construct the roads in the hands of the local authorities, giving a moral supervision to him, would have a very great effect. I would be glad to go with the gentlemen who just spoke before the committee on roads and bridges and have something to say on that subject if he would like to have me.

R. T. Roberts, of Kenosha, Wis., offered a resolution, which was referred to committee on resolutions.

AFTERNOON SESSION.

President Arnold — If you desire to discuss any of the papers that have been read, there will now be an opportunity for a short time. I will state that the executive board of the State Agricultural Society were waited upon by the farmers in the legislature, who requested their attendance to have their views of what they desired in the shape of legislation this winter. We responded to the call. Among other things,

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they said they had a bill before them to establish a state agricultural college; that the committee on agriculture had that bill, and they desired the action of this convention on that proposition before they took action on the bill. (Bill No. 84, assembly, read.)

Mr. Broughton moved that it be considered the sense of the convention that the legislature should pass the bill.

Prof. A. F. North—I understand that Mr. Sloan is interested in this subject, and it appears to me that this society would be better able to act on this resolution after having heard him.

Mr. D. F. Sayres—It seems to me that the state of Wisconsin needs to put itself on an equality with our sister state of Michigan in regard to this agricultural college. We really have not anything that answers that purpose now, and this bill looks forward to and gives us an opportunity of having a college for our farmers' boys, which we want, and it seems to me that it is the interest of this society, and of us as farmers, that this bill should be passed.

Mr. Hoxie—I understand that Prof. North has a paper upon this subject, and as there are two papers by eminent parties who have had this subject under consideration, in order to obtain the fullest knowledge on this question that is possible, I would move that these gentlemen be requested to produce their papers as the preliminary to this discussion.

FARMERS' SCHOOLS.

By A. F. NORTH.

I assume that among the objects of this society, these three are of prime importance:

1st. To secure increased and more profitable results from the farmer's labor, that is, that he may be enabled to make two blades of grass grow where only one grew before.

2nd. To secure to him the full and just results of his own labor.

3rd. To ascertain and secure such a condition of things

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as will induce the highest possible degree of intellectual culture among the farming community.

I may be mistaken in these assumptions, but I deem it due to this body to say that it is upon these assumptions that I have prepared the following paper on

FARMERS' SCHOOLS.

The science of agriculture strikes its roots deep down into the sciences of chemistry, geology, meteorology, botany, biology and other kindred sciences, and it goes without saying that no school or university can give, and that no single student can have such a thorough mastery of all these as, in the way of original discovery, will be of any considerable value to him as a working farmer. Any school that should profess to do all this with a modicum of Greek and Latin thrown in, would in the very act become a convicted quack, and the student sent out, believing that he had accomplished all this, would not be very far from reaching the ranks of the learned fools. In the future, as in the past, this difficult, laborious and important work must be relegated to the specialists, such as Liebig, in agricultural chemistry, Posteur, in the germ diseases, men whose gifts and appetencies adapt them to that work. A school where one half the students' time was occupied in work on the farm might well make experiments in the line of these original investigations, and posbably determine there, better than in the laboratory, their value to the practical farmer, with the best means and conditions for their general and profitable application.

But in addition to the three Rs, which constitute the grand indispensable foundations of all learning, indeed of all civilization, and a practical acquaintance with his profession, there are certain knowledges (to use Bacon's expressive term) with which the farmer, as a farmer, a citizen, and as a man should have a sound, familiar and practical acquaintance. They may be called the three Ps — Political Science, Political Economy and Polite Literature.

It is acknowledged that there is no condition of society more favorable to the existence of a strong, stable, prosperous, free commonwealth, than that in which a large portion of

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its constituency is composed of intelligent possessors in fee simple of the land they cultivate, and in no considerable portion of the world, ancient or modern, has there been, or is there such an opportunity of securing such a constituency as in our own United States of America, and it will be inexpressibly sad if, by our unwisdom, we, who are laying the foundations of a state and galaxy of states, shall fail to establish this condition of things and make it irrevocable.

We should never forget how much the endurance and prosperity of a nation depends upon its having a just government, and that, therefore, that portion of its people that constitute its backbone should also be its brain; that they should well comprehend the true basis of governmental authority, the just limits to the exercise of its powers, and the best methods of guarding against any undue enlargement or maladministration of its authority.

We must not flatter ourselves that because our government is strong and prosperous now, that it will never encounter the storms and shocks to which others have succumbed, or even the whirlwinds that have swept them from the face of the earth. Our safety lies in the intelligence and integrity of our people. Hence, the necessity of a knowledge of political science among our people.

But the farmer is also a producer of wealth. He draws it at first hand from the soil, and surely if any man has an indefeasible right to the full measure of what he earns, the farmer is that man. But the farmer has to exchange that part of his products which he does not consume for wealth equally valuable to him drawn from other soils, from the mine, the loom, the manufactory, both of his own and of other climes. He should therefore have an intelligent apprehension of the fundamental principles that conduce to the fullest production of wealth and the fairest and justest distribution of it among those that produce it. It is asserted by some that of that moiety of his produce that the farmer exchanges he is robbed of a large share by middlemen, by transportation companies, and by unwise legislation, improperly called protective. On the other hand he is warned and to a certain extent interdicted

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against taking in exchange for his surplus products anything produced outside of 30° and 49° north latitude and 70° and 130° west longitude. So earnest are those of this way of thinking that we need not be astonished to hear them counselling us farmers to keep a close watch over those pesky astronomers, who with their big telescopes are bringing the moon within a few miles of us, because as we all know that the moon is made one-half of green cheese and the other half of creamery butter; should they succeed in bringing it within reach, it would be the inevitable destruction of the great dairy interests of the United States.

There is a need that the coming farmer should be well informed in such matters, and this the study of economies will supply, and this science therefore should be a branch of the curriculum for our farmers' schools.

But above all the farmer is a *man*, and he should be so trained that he can intelligently read and inwardly digest the best thoughts of the best authors of all ages, in all matters that pertain to humanity — Homer and Virgil, Demosthenes and Cicero, Dante and Cervantes, Gœthe and Moliere, Bacon and Locke, Shakespeare and Milton, Scott and Dickens, Huxley and Tyndal, David, Solomon, Isaiah, Paul and Christ. Indeed the whole field which English literature, either by translation or otherwise, presents, should be his to enjoy and profit withal, to refresh him in summer and cheer him in winter.

There is every reason to believe that were justice done the farmer, the next generation would show the farmer the peer in the matter of culture, with the lawyer or the doctor, the clergyman or the professor, the merchant or the manufacturer, if indeed he would not in some respects be their superior, for in the words of Tyndal, "We need muscle as well as brain, character and resolution as well as expertness of intellect. Lacking the former, though possessing the latter, we have the bright foam of the wave without its rock-shaking momentum."

The freehold farmer in Wisconsin represents in himself and brings to bear on his industry the three wealth-producing elements — labor, skill and capital, mind, money and

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muscle. We have a soil and climate favorable in more than an average degree to human industry. We have the most improved farm machinery, access to the best breeds of domestic animals, a valuable agricultural literature and have fairly accessible to us the best markets of the world. A man possessing even but a hundred acres under these circumstances should, in the command of the comforts and indeed of *some* of the elegancies of life, be second to none in any other vocation in the state. But any one who has an extensive acquaintance with the great body of the farmers in Wisconsin, knows that in no department of industry, professional or otherwise, does the same amount of capital, skill and labor produce such poor pecuniary returns as does that of the farmer. Now there must be some iniquitous influence worth searching into, that brings about the deplorable results to which I shall presently refer and which I take it is the chief point in this paper.

A farmer anxious for the best interests of his family, labors to secure for his children, what perhaps he had not himself, a good education. He would be glad that in his old age these sons that he had educated should take his place on the farm that he has redeemed from the wilderness. But if his sons are energetic and ambitious, men of character and intelligence he is doomed to disappointment. They see that as teachers, doctors, lawyers, merchants, book keepers, nay even as patent right and lightning rod peddlers, they can make more money than by farming, and, as it appears to them, that in this world, at any rate, honor and happiness are graduated and determined by the money standard, they resign the farm and their father's home to the dull, stupid ones or transferred to the immigrants from overcrowded Europe; not always the best material to make a state of.

Now it seems to me in this lies the great obstacle to success in maintaining schools that will breed up from among the sons of our farmers and mechanics, broadly intelligent farmers.

If the soil of the United States should be owned in large tracts of some two or three thousand acres, as it is in Europe (which God forbid it ever should be to any great ex-

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tent), we should then have a field for our young educated farmers as owners and managers of such estates, where they would receive such remunerative salaries as similar services receive in Europe and our schools of agriculture would never want students; they would be a success under the shadow of the best classical university in the world.

But with the utmost deference I would beg to say that it appears to me, there is another alternative. If we had no favored and protected, monopolistic classes in the United States and therefore no corresponding robbed and pillaged class here, the farming profession would become as desirable, because as pecuniarly profitable as any other profession, and the best specimens of our educated young men would gladly enter upon it, our agriculture would develop a greater degree of skill and success and the whole commonwealth would be elevated and strengthened as the result.

The farmers or the farmer's friend so called, clamored for a grant for agricultural colleges, and we got the grant and the college here in Wisconsin, and the cry is now one of bitter disappointment. The boy cried for that beautiful honey-producing bumble bee and he got it, and he threw it from him leaving with him only a very unpleasant memory.

The same parties are now crying for something different. Would it not be well for us as farmers, for I also am a farmer or a piece of one of 40 years' standing in territory and state of Wisconsin, would it not be well for us before we demand that *something*, to be reasonably sure that that something is the *thing* that we really need? We are told that the exact thing needed by us is found in some of our neighboring states and that the small matter of two or three hundred thousand dollars will get it for us and fifty thousand more annually will keep it. Now this may all be so, being unenlightened in this matter I cannot speak. But this I know if this were any of our private affairs, before incurring such an expense, we would learn not by the hearing of the ear only, but by actual inspection of the working of the system whether it is really the system suited to our wants. We would hasten slowly. We would not rashly

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court another disappointment. We would send down a committee of our most capable, practical, thoughtful, sober-minded men to investigate the matter thoroughly and report.

Now may it not be, that that which would be wise for us as private individuals to do, would not be an act of unwisdom on the part of the state?

But, it may be said, the function of the agricultural schools we want is not solely to raise up an army of intelligent young farmers, but also to experiment with, and improve our domestic animals as well as to increase the quantity and improve the quality of our vegetable products. This if I mistake not, has been done and well done both in Europe and in this country by private individual enterprise with very little direct aid from agricultural colleges. Witness our Durham, and Devon, and Angus and Ayreshire cattle, our Clydesdale and Morgan horses and our various breeds of sheep and swine. The same I think is true of our cereal crops and also of the products of the orchard and garden, and I think it is not expecting too much to look for the time in the near future, when the farming interest freed from the incubus of monopoly and adverse legislation and left free to develop itself according to natural law, will be guided by the highest intelligence and will enter upon a career of improvement here in the United States, greater than any that the world has ever before seen.

At the conclusion of the paper Prof. North added: Now I beg not to be misunderstood. You are not to suppose from this that I am opposed in any degree to experiments being made by the state and by the Agricultural society, but I tell you what I do know, I know that the state already has, throughout this state, four or five admirable farms. There is one in Waukesha, owned by the state, belonging to the industrial school. There is nothing at all to hinder experiments being made there at a very little cost, under the instruction of the gentleman at the head of the institution here at our university. They have the means; they have

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the soil; they have varieties of soil; they have the labor. They have boys there that it would do good to have engaged in that. They have the means of measuring accurately, of weighing accurately, every operation in which they are engaged; and here, at the most trifling expense, the state would be able to get back from that institution some little equivalent for the cost that these boys are to us. In making inquiries of the superintendent of that institution — they have shoemaking and other occupations — he informed me that the occupation that produced the best results in reforming these boys and fitting them for good citizenship was just that employed on the farm. Let that farm then be a place where these boys cannot only do more than merely acquire the mechanical power to work the farm, but interest them in experiments, and I think then that we may expect that the thousands that we pay for the support of that institution may in future time come back to us, not only in the improved morality of the boys, but in something of a pecuniary value to the farmers of the state, who, in general, support it. We have also others. The insane asylum and all those institutions might be made practically useful. While I would not discourage in any degree a farmers' school, let us, in the first place, be sure that the school is what we want, for we, as farmers, cannot afford to have another state disappointment. We cannot have another two or three hundred thousand dollars, as some of you say, thrown away. I do not think that it is entirely thrown away. That is not my judgment. Still let us hasten slowly.

Mr. W. D. Hoard offered the following resolution:

Resolved, That, in view of the tremendous difficulties which lie in the way of reaching the agricultural mind, and bettering its knowledge, and the reward of its labors, it is the sense of this convention that nothing can be done for it, by any of the forces of law, society and common sense The farmer is of necessity a gone goose.

Referred to the committee on resolutions.

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THE AGRICULTURAL OUTLOOK IN WISCONSIN.

DR. A. C. BARRY.

Mr. President, Ladies and Gentlemen — I like this farmer's convention, which assembles so great a number of agricultural people in our capitol city every winter, for one reason, mainly: that by means of it those who are the reprentatives of the various agricultural industries — the general farmer, the stockmen, the wool-growers, the horticulturists, the dairymen — are brought into closer sympathy; and their diverse thinkings and views, lying in the mind without power, because without expression, take form in speech so that everyone will be a learner, and each one, perhaps, a teacher.

I also like the convention because it offers to those to whom it sends invitations, and to all comers, a broad free platform. It would have every man who stands upon it speak his honest convictions, untrammelled by dictation or limitation; if so be he speaks in a right spirit and with a right purpose.

And it has already demonstrated that there may be union with diversity of opinion and of calling; that men may be one with regard to objects to be promoted and accomplished while differing as to means and methods, that they may be a unit touching some great vital question, and yet divide on a collateral or minor issue. Besides, they who compose this convention, know no difference as to party or sect, and recognize none of the distinctions of rank and place.

All of every industrial calling, all who toil with hand or brain, belong to the great Brotherhood of Workers, among whom, when associated as to-day, there is neither high nor low, neither great nor small, neither male nor female, "upper crust" and "under crust," are not in their fraternal vocabulary; if anything all "under crust," without which, however sugared and ornamented the "upper crust" might be, the pie would be a sorry affair, and of certain best sorts an impossibility.

Thus in this convention of farmers we have unity with

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variety. This is in accordance with the order of nature. The most perfect unity is compatible with the greatest variety. It consists in no metaphysical oneness, but in the harmonious arrangement of parts that are different. All nature is adapted to this constitution of the human mind, for the whole created universe is a unit. Amid an endless variety, the harmony is complete, the unit perfect — a unity all the more perfect because of this variety.

This order of nature, I am glad to say, obtains largely among the great brotherhood of workers, among whom, generally speaking, there is only the contention, the rivalry, if you prefer to call it such, as to who best can work and best agree. I find it so in this convention. Not that all think alike — not that there is any dead uniformity in this regard; but that they are content to work harmoniously together, despite their differences of opinion, conflicting experiences and pursuits and are one in their devotion to a great common cause, or to the paramount interests which they represent.

Whatever we are, we have not made ourselves; the times have made us. The science, literature, politics, progressive instincts, and providential development of the age, acting upon us by organization, antecedents, position, temperament and experience, have produced in us certain convictions, impressions and tastes, which sway us in one or another direction, and shape us for certain callings, and we are content to have it so without quarrel, and to come together upon a common platform of speech and work, with an intellectual perception of what the times demand and what the future is to be.

I may say once more, on my way to my theme, that I like this convention of farmers, because it means progress, it means growth for the varied industries represented in it. It is itself a recognition of the fact that a tree must have branches as well as root, and so its tendencies must be progressive. It presents us with more than belief in a root; if it did not, it would not stand for growth, it would not be a sign of progress; for a root may be a dead one, and so could only make fossils of men. It presents us with more than

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belief in a branch and a denial of the root, for while it is a call to growth, and stands for growth, and is a help to growth, it would furnish something to grow from. Thus, while it is a repudiation of "old foggyism," which holds that further growth is at an end, and therefore can only stunt and fossilize, it equally rejects what may be called "young flightyism," which asserts growth without the root, and hence furnishes no basis of growth. Only live things grow. Hop poles do not grow.

These two "isms" are incarnate in a great many institutions, in a great many men. It is possible they may find their representatives and votaries among farmers, and write themselves in boldest hand upon the very soil, and in the very look of the farm. Here is the conservative, as he would call himself, but he is something more than that.

He does not believe in the injunction, "Prove all things; hold fast that which is good." He would not prove, that is, try, test, anything, but would hold fast whatever is, right or wrong, good or bad, useful or useless, true or false, living or dead. His adopted motto is, "Let nothing go," and so he holds on with tightest grip to old theories, old usages, and would burn sulphur under the nose of a new heresy. He has perhaps selected some quiet, comfortable corner for himself, and there he would dream the old dreams and not be disturbed. Speak of reforming abuses, of striking out new paths, of seeking upper levels, of bringing in sunnier days, and his ready and stereotyped reply is that the world is well enough as it is, and all this stir and agitation and debate is useless and pernicious. Often his horizon, unlike the vast rim of the sea, or distant range of snow-crowned mountains, has no wider bounds than self; and his heart, like a man's coffin, is just his own measure—long enough and broad enough to hold himself, with room for no one else. If he is a farmer, he inveighs against new fangled notions, and believes in sticking fast to old ways, old habits of thought, old theories and old methods. He loves the old and venerable because of their antiquity, and if ever he moves with any rapidity of pace, in a forward direction, it is because, like the turtle, he has a coal of fire on his back!

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Book farming, experimental stations, agricultural schools, and the like, are his special aversion, and he is likely to hold with not a few of other callings, that it is folly to undertake to place agriculture on a level with the learned professions. I do not forget that, in this transitional period and day of new things, there is a deal called reform that might better be called almost anything else.

It reminds us of the bill of the Irish farrier: "Mr. ——, Dr. To curing your horse until he died, $10." It is a process of curing by killing, like cutting off a sick man's head by way of bleeding him! Or it is a little more than surface agitation, but the merest rubbish concealing the real thing from view.

Let us see, now, that while the conservative would have no taking down and rebuilding, but would have us satisfied with whatever is, with old laws, institutions, practices and forms, he in whom "young flightyism" is incarnate would sweep clean off from the face of the earth, every existing institution, law, custom, and doctrine. He would not leave a landmark of the past, not a broken column, nor an inscription, nor a letter, nor a foot-print even, by the aid of which we might trace the journeyings of humanity through its wilderness of thousands of years toward the promised land. And this he would do by way of getting at the root of things, and emptying the world by one mighty capsize of all that is false, wrong and oppressive. Now the man that would prove nothing, hold on to nothing; who would reject everything, the good with the bad, the right with the wrong, the true with the false; who would tear down and not reassemble the fitting material in new and more comely forms; who has a torch burning, but no hammer for building, such a man is simply mad, and ought to be put into a straight-jacket.

The radical method of reform is well taken off by Hawthorne, in an article entitled "Earth's Holocaust," in which he represents this wide world as having become so overburdened with an accumulation of worn-out trumpery, and with evils and woes of greater or less magnitude, that the inhabitants determined to rid themselves of all by a general

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bonfire. So they heaped together, in one great pile, all that divided, oppressed or in any way afflicted humanity. Not an outward form of evil was spared. There were the purple robes of royalty and all the insignia of kingly and priestly power; all the intoxicating drinks in the world were brought to the burning; tea, coffee and tobacco were added to the pile; then the implements of war; then racks from the dusty nooks of ancient prisons, headmen's axes, and sanguinary gibbets; then creed book and ritual, church constitution and the bonds of sect; then a variety of outgrown and useless things, such as marriage certificates, bales of bank bills, day books and ledgers, notes and other evidences of debt, and all the title deeds of real estate. The good and the bad, the true and the false, the useful and the useless, the worn out and the ever new — all were added to the immense pile which was burned to ashes.

This was the extreme radical method for purifying the earth and ushering in the "good time coming." The devil stood by all the while and laughed in his sleeve. There was one thing that was not burned, and that was the human heart, and out of it crept the same old shapes that had just been consumed.

Here and there, even among our agricultural brethren, may be found those — not just like the man I have described, but with much the same virus in their blood — who despise the past, deride its wisdom, reject its experience, and hold the theories, methods and labors of even the really progressive of their contemporaries as of no worth.

Thus cut loose from all safe moorings, they are adrift upon an unknown sea, destitute of compass or chart. Or they are like a man in a boat upon a river who uses only one oar.

The result is much the same practically as though no rowing was done at all. In either case the boat would drift with the stream; and the only difference would be, that vigorously as a single oar might be applied the boat in addition to drifting, would move round and round in a circle only mocking the rower by the semblance of progress.

It is not to be wondered at, after all, that even among the tiller of the soil, there should be those who sow in dreams

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only to reap shadows. In these impracticable theories, these vaultings to reach the summit of attainment without any root to grow from, are but the swing of the pendulum from the old conservatism to the opposite extreme. And we need scarcely wonder that, among many others, the man who follows the plow should be haunted by visions of a new day which he may help to bring in, when we consider the conquests we are making over the material world; these busy fields of action, which open to the eager spirit of the nineteenth century; the discipline, the power, the vast historical and providential results, which grow out of this extended area of thought and achievement; and all of which are prophetic of a golden age to come.

Besides it is easy enough to see that this large and varied action rebukes all ascetic conceits, and teaches the religiousness of all life, and the sacredness of every field of effort. Yes, to even the farmer it may be said, and more appropriately than to others, "Put off thy shoes from off thy feet, for the place where on thou standest is holy ground."

Here in Wisconsin, copying the old ignorance and blundering of the elder communities, we have had our many years of unintelligent and unscientific farming, in which years, with darkened eyes we went on robbing of its riches the best soil God's sunshine ever warmed, or the rain from heaven ever watered and fertilized. We said it could never be exhausted and it almost seemed so and therefore we prosecuted our plundering methods, and levied our impoverishing taxes, until we provoked rebellion and retaliation. In the end the abused and trampled soil turned upon us, and for our plowing and sowing and reaping gave us "stump-tail" wheat, worth only 18 or 25 cents per bushel. There are those present at this meeting who can testify, that, twenty-five and thirty years ago, the condition of agriculture in our state was pitiable indeed, generally speaking. Here and there were a few sensible, thrifty farmers, under whose intelligent management the soil lost little of its fertility, and the evidences of substantial prosperity were multiplied; but the great mass of our farmers were such only in name; ignorant of nature and her laws, destitute of a knowl-

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edge of the simplest principles of agriculture, and with no very great desire to learn; and so went about their work in a hap-hazard, slouching way, doing what they could to reduce their fair, fertile acres to an unproductive waste, save as they grew weeds foul and rank. When this result had been reached, they suddenly awoke to the thought and investigation — that is the better part of them — and the inquiry came up as to the remedy for a condition of things brought about by their mismanagement and blundering ways.

In their groping they came upon book farming, which all along they had laughed and sneered at. It occurred to them that the combined experiences of the many leading farmers might be of some worth, though printed in a book, or in a paper, that science might furnish aid, and help be found in association. At once, almost, they were upon the anxious seat, and by-and-by were soundly converted — all save a few miserable sinners, too far gone ever to be reached and saved.

If now we were asked, "What is the agricultural outlook in Wisconsin?" an answer might very well be found in this convention. It is not flattery to say that in it is represented the intelligence, the culture, the progressiveness, the real strength of this grand and prosperous commonwealth.

There are men on this floor, the peers of those eminent in other professions, who stand and speak for thousands of their brethren throughout the state, by whom the truth of the words of Webster is proven anew and clothed with a larger meaning, that agriculture feeds us, to a great extent it clothes us; without it we should not have manufactures, and we should not have commerce.

These all stand together, but they stand together like pillars in a cluster, and the largest is agriculture. A most honorable calling is no longer held to be low and servile. In the general estimation this business of tilling the soil, of caring for flocks and herds, of filling the land with plenty and with forms of beauty, is no longer disreputable, but noble; and labor, with its hardened hands, and dusty, sweating brow, is consecrated as dignified and imperial, before which the

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greatest of earth should pass with uncovered heads. It is only the drones, who toil not, who infest the hive of activity, like masses of corruption and decay.

The lords of the earth are the working men, such as have their representatives in this convention, who can build up or cast down at their will, and who retort the sneer of the "soft-handed," by pointing to their trophies, wherever art, science, civilization and humanity are known. It cannot be a great while, if their representative men continue to increase in numbers and in the measure of their mental and moral equipment, before it will be common to look to the agricultural class for the best bred, as well as the best fed, men in America.

I trust that I am not so lacking in gallantry and a sense of justice as to pass by our women, so excellently well represented on the floor of this convention, without a word of kindly recognition. Especially would I not forget to pay my tribute of respect and esteem to the memory of one of their number whom I used often to meet at gatherings like this. And yet you do not need my words, especially you, ladies and gentlemen of the State Horticultural Society, to tell you how pure and beautiful and almost angelic was the life of her who suddenly, in the prime of her grand womanhood, was called away from us. With such an one in heaven looking down upon us, still a ministering spirit with a swifter wing, her life a song set to diviner music, how ought we to strive after all purity and goodness, and to make all discipline whether of labor or pain, or sorrow, or loss and all sad memories, a means to our spiritual elevation, and to a fitness for a holier and dearer companionship in the to-morrow that shall succeed this earthly day!

Undoubtedly home will always be woman's world. She will be crowned monarch over its rich and far-stretching realm. In the studios of home she will carve the forms of her thoughts into the statuary of living character, and picture upon soul canvass the spiritual beauty of her faith and love. Though she may go out to do great deeds of goodness in the world; though she may speak from forums, teach from college chairs, write books, fill offices of trust and

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profit and serve in many helpful ways, she will still love home best of all places, because it is in her nature to do this. Open the whole wide world to her and tell her to find employment, usefulness and happiness wherever she can, and she would instinctively, and with all the yearning of her woman's nature, seek them in the place called Home. This is the seat of empire from which she rules the world.

Everybody will say, that if the home sphere shall be worthily filled, and a strong influence for good go out from it, there must be right conceptions of what home is, and then of what are the necessary qualifications for those who shall preside over its destinies, and wield its powers. It is forgotten, often, that homes are not made up of material things, or do not necesssarily consist of a fine house, rich furniture, a luxurious table, a beautiful garden, and a splendid carriage.

These are all very well, and are to be prized if one can afford to have them. Still, all of them may be possessed, and the best, the only right idea of home not be realized. Some lonely, moorland cottage, with its bare walls, its scanty fire and its dearth of bread, yet with its plenteousness of domestic affection, its wifely faith and husbandly devotion, may better realize what home is, or should be, than the grandest palace ever reared by the hand or adorned by the wealth of man.

This is not quite what I intended to say when I set out, and yet it is on the way to my saying, that while the preparation for the duties and employments of the farm home is such, in a general way, as I have described, there are in this home special demands to be met by woman, requiring special preparation. Learning, grace, refinement, and a knowledge of domestic economy, are important, not to say essential, here as anywhere; but in addition there should be a pretty good knowledge of farm work, or of agri cultural economy, and some part of it of a practical sort.

It is said of the English women, that even in the highest rank, that their fondness for out of door life, horses, dogs, fine cattle, animals of all kinds; for their grounds, their gardens, and in short everything that belongs to their homes,

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that their real, unaffected knowledge of and pleasure in these things, and the unreserved way in which they talk about them, would startle some of our young women who have been educated to think all such things vulgar and unlady-like.

Gardening is an English lady's special province. An English woman, with no taste for gardening would be as great a marvel as an angel without wings. And these fresh-looking girls, who have so thoroughly entered into these rural enjoyments, are not mere country lasses and dairy maids. By no means. They will converse with you in three or four languages, are well grounded in modern literature, can sketch from nature with the ease of professional artists, and will sit down to the piano-forte and give you an old ballad, or the finest German and Italian music, as your taste may dictate. And yet many of our young country women, whose education, mainly for the drawing room, is far below what I have described, would half faint with terror, and half blush with false delicacy, were they to hear these English girls discuss the farm yard, meadow and stables, which discussion is not in the slightest degree at variance with real delicacy and refinement, and is part and parcel of a wholesome country life. We very well know that there are many sensible, educated young women at home, who have the same breadth of cultivation and the same variety of resources, that make the English women such agreeable companions; but we also know that there are many born and reared upon the farm even, whose beau ideal is bounded by a circle that contains the latest fashionable dance for the feet, the latest fashionable novel for the head, the latest fashionable fancy work for the fingers.

I cannot see why the girls should not be educated for the farm and for a participation in certain of its diversified employments, as well as the boys. Certainly there is need that they should be. The old employments of woman are passing by. Lowell does the work of the spinning wheel. The sewing machine is annihilating the needle, and a new problem is to be solved in the position of women. However cradled in comfort or luxury, the great mass of them find small

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place in life for their energies and have to take their chance for existence in the choice between husbands and nothing; and that, as some one has said, is often a chance between two nothings. And yet these women thus wasted and weary, what is there in existense which they might not claim? What place in the universe they might not nobly fill?

The new problem just mentioned will find its completest solution on the farm and by farmers, where and by whom a great many knotty questions are untied.

A partial solution has already been reached, and we find women skillfully managing large agricultural interests, and exhibiting an ability and an enterprise not often displayed by men.

A further and larger solution will be reached — we are on the way to it in Wisconsin, and that way is by the farm-house as well as the school-house — when we educate aright and without distinction.

Now, we do not educate a man to be great simply in emergencies, we ask that he shall have manhood in him, that he shall create his emergency for himself, that he ought not to wait for victory to come to him, but should, like Napoleon's marshal, be "victory organized." We must train women to meet the same demand, and clear the way for the exercise of her reserved power. It is not right that her whole life should be dependent and accidental. It may be that if we will grant her political enfranchisement, she will herself solve all problems relating to her position, or as what she shall be and do. There will then be no longer need to ask the question: "How either boys or girls are to be kept upon the farm?"

I have spoken of the improvements that have met with wide adoption among us, in the system and modes of farming, and which make the agricultural outlook hopeful indeed. Every where there is a clearer comprehension of the fact, that the whole routine of operations upon the farm, year in and year out, are only the processes of a great chemical laboratory, in which the farmer is the manipulator. And yet this is true also, that with the limited stock

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of knowledge he possesses of underlying principles, he works about as understandingly as did the alchemists of old. He furnishes the materials, and adjusts the preparation for the experiment; chemical action brings about the results. He plows his fields, new compositions and decompositions ensue, and elements essential to the growth and nutrition of plants are prepared from materials existing in the soil or derived from the atmosphere. He sows or plants his seeds: chemical action excites them into new forms of life.

From day to day that action is continued in roots, stalks, leaves, flowers and seeds, and with the aid of vitality takes up from the soil and the air, the specific aliments for their growth and development. At the same time all matter not required is excreted. The ripening of fruits and grain is due to chemical action. If wheat, it is next cut, dried, threshed, winnowed, ground and bolted into flour, partly by mechanical and partly by chemical agency. From the flour barrel, till it appears on the dining table as the white loaf of bread, it is constantly passing through a series of chemical changes. The curing of fodder, the feeding of stock, the products of the dairy, every manipulation of cooking, the collecting and preparing of composts, the fertilizing of land, in fact almost every occupation of the farmer, call into action the laws of chemistry. From very necessity he is a great chemist; yet, unfortunately, he has been required to fulfill the duties of his calling destitute of a knowledge of the laws under which he is compelled to act. His only aids have been routine and tradition.

At last better times have come, and better still are coming. The schoolmaster is abroad, and to their other acquisitions our foremost farmers are adding a knowledge of agricultural chemistry, its principles and application.

Luck and chance are beginning to be discarded; guesswork is being exchanged for that which is creation. Familiar with the various soils of which their farms are composed, these farmers to which I have alluded know how to arrange the rotation of crops, and how to supply enriching materials, so that they shall be sure of obtaining a remunerating yield of products from year to year, and at the same

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time the land be left in an improved condition. Continuous cropping has been abandoned. There is less plowing, and yet a larger reaping.

Waste places are reclaimed, the bog converted into dry land, ragged edges smoothed down, and there are no corners for weeds and bushes. The advantages a diversified farm industry possessess over one that is confined mainly to one product is clearly and decisively shown. Not only are damages from failures of single products lightened, reduction of prices from burdened markets prevented, but employment is given to all classes, conditions, and capacities of labor, remunerating wages for workmen insured, the necessary rotations of crops and the production of farm manures rendered possible, and the wealth, intelligence, and power of the State increased.

The example of our representative farmers is contagious and their intelligent labors are full of inspiration. This is seen in the improved process of agriculture upon nearly all our farms, and in the use of means for the more economical production of the old staples. We have not yet attempted high farming as it is called, save in few instances and in a limited way; but the wave of progress is bearing us on in that direction. No doubt we undertake to cultivate too much land, and therefore cultivate too poorly, even where cultivation is at its best. The celebrated Robert Blakewell, of England, used to tell a story of a farmer of the olden school, who owned and occupied one thousand acres of land and had three daughters. When his eldest daughter married he gave her one quarter of his land, but no money; and he found, by a little better management, the produce of his farm did not decrease. When his second daughter married he gave her one third of the remaining land for her portion, but no money.

After giving away half his land to two of his daughters, to his great surprise he found that the produce increased — he made more money because he set to work to make rich land of poor furge land, and at the same time he farmed the whole of his land better, for he employed three times more laborers upon it; he arose two hours sooner in the morning,

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and had no more dead fallows once in three years. But the great advantage was, that he had got the same money to manage five hundred acres, as he had to manage one thousand acres; therefore, he laid out double the money upon the land. When his third and last daughter married, he gave her two hundred and fifty acres, or half, which remained, for her portion, but no money. He then found that he had the same money to farm one-quarter of the land as he had at first to farm the whole, and he began to ask himself a few questions, and set his wits to work in determining how he could make as much off of two hundred and fifty acres as he had off one thousand acres. The way was found without much trouble. He took the place of his bailiff and instead of saying, "Go boys," he said, "come boys." Every rood of his land was made a very garden for richness. He sowed less and plowed better. Cattle, sheep, horses, of the best breeds took the place of inferior animals; nearly all the grains and roots upon the farm were consumed upon it; and the result was he grew more, made more off two hundred and fifty acres, than he had grown and made off one thousand acres. We get from this story the how and the why of successful husbandry and farmers' wealth. Our people are learning its lesson and committing it to practice. Instead of seeking to double the extent of their farms the endeavor will be to double the increase of crops. More and better shelter for stock will be provided, and thus they will be kept in better condition and at less expense. Farm buildings will be improved; the farm houses, especially, be made more commodious and convenient, and the grounds around it more tasteful and ornamental.

Right here I may be permitted to say of the farmer, that he ought to be so in love with nature, with whose visible forms he holds such nearness of communion, as that he should be developed into the truest of artists. Just as the image in the soul of both composer and painter is transferred to manuscript in musical characters by the one, and by the other is embodied by the pencil in chords and melodies and harmonies of color upon the canvas; so the farmer

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should so work with the hand and eye and taste of a master, as that field, and woodland, and orchard, and outbuildings, and garden, and house, and lawn, and roadside, should all be wrought into a living and beautiful picture, a symphony, an idyl, in color and harmony and rhythm blending with the glory and song and poetry of this wonderful nature around us, instinct with the life and beauty of God!

We are beginning to see, that, with all our marshes, our drift hills, our large tracts of sand rated in value as next to nothing, we really have no waste land. Vast reaches of marsh land have already been reclaimed, and converted into wonderfully productive fields. Even our high gravelly ridges, well-nigh barren but for their stunted oaks, can be put to valuable use. And when we get about it we shall find a way to make our sandy lands, now so poor, worth one hundred dollars per acre, and sought after at that price.

I can very well remember when the tract of sand between Schenectady and Albany was regarded as entirely worthless for agricultural purposes. It grew nothing but dwarfed oaks and pines, the merest brush, and its only value was in what these were worth for fuel in the Albany market. One day it occurred to the mind of Judge Buel that this barren sand had wealth in it for the farmer, and here at least was a foundation for something better, and that this waste tract could be reclaimed and made fruitful as a garden. So he set to work in an intelligent way, not to build a house only, but a farm upon the sand. How well he succeeded you all know from his own published history of the experiment. Only a few years went by before the acres he put under treatment were of wonderful fertility, and were increased in value a hundred fold. All the money he expended upon them, adding the cost of labor, came back to him with large interest; and thence forward they constituted a bank which discounted him liberally upon application. So the sand upon which he built became a rock, and his wisdom was vindicated.

By means of what he had learned of agricultural science, Judge Buel was enabled to achieve imminent success in many departments of farming. As a theoretical and practical far-

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mer he was far in advance of his cotemporaries, and through his writings became the teacher of many thousands of his brethren. Learning and demonstrating the importance of scientific knowledge to the agriculturist, which knowledge he had gained in round about and laborious ways, he was among the earliest advocates of the Agricultural College as an indispensable help to farmers, or a means for preparing them for their high calling, and promoting the leading interest of the country.

A memorial addressed to the legislature of New York, in 1849, both reiterated his views, often and earnestly expressed, that agriculture should have its schools, its model farms, and all the varied agencies that are supplied for the education of men for other professions and pursuits; that the coming generation of farmers, through the influence resulting from such institutions, would be an intelligent, a reading and thrifty class of men; that agriculture would then cease to be a mere calling, but would most appropriately be denominated a profession; that men educated in these schools would not only be initiated in the arts, mysteries and beauties of their profession, but would be well fitted to take position in all active, useful and public stations by the side of those coming from our higher seminaries of learning, and from the highest walks of professional life.

I give only the substance and in the briefest form what were the profound convictions of leading agriculturists, thirty, forty and even fifty years ago, and which have come to possess so many thoughtful minds in these latter days, that the agricultural college, pure and simple, is an absolute necessity, if, through the education of farmers for their profession, we would have agriculture promoted to the high rank to which, by reason of its paramount importance it is entitled. And it has been well and pertinently asked, in what other manner than through a complete system of practical education, shall we be enabled to prevent the thronging of the sons of farmers to the learned professions, to the great cities of our country to engage in the hazards of mercantile pursuits, instead of continuing in that calling which secures to them the most complete enjoyment, a sure

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competency, and the obtaining the highest eminence our country has to bestow?

I am here led to remark that the agricultural outlook in Wisconsin is bright, because of the promise, that at no distant day agriculture shall have its separate college in this state, thoroughly equipped for the work to which it shall be set apart. The missionary, with ready and eloquent speech, has been going up and down amongst us, and has prepared the way. The ball is set in motion, and cannot be stopped, It cannot be long ere the Farmers' College, which now exists little more than in desire, and resolution, and petition, and executive recommendation, shall be an accomplished fact. Then, while means and agencies are multiplied, large amounts of money appropriated and expended, schools planted, colleges and universities founded and liberally endowed, the rich stores of science, literature and art laid under contribution, and learning, eloquence and genius called to preside, to teach, to inspire, and all to train and qualify men for the bar, the pulpit, the practice of medicine, the teacher's desk, or other professional positions; it shall not be said that the profession of agriculture, which underlies all professions and pursuits, and is the main support of them all, has no school of its own, specially devoted to the education of young men for the farm, and for a prosperous and happy farm life.

I here cheerfully bear testimony, Mr. President, to the help of many kinds rendered by the Agricultural Department of the University in the work of agricultural improvement. It has not fallen behind other departmental schools in this regard. If for reasons well-known it has failed in securing many students, and its graduates all told can be counted on the fingers, it has at least been the means of disseminating important knowledge among the farmers of the state, not only through the published results of its experiments, but through the labors of its professors outside of the class-room, the laboratory, and the experimental farm. It is a matter for congratulation that the chairs of the department are so ably filled, and that since our sons will not go to their learned occupants to be taught, they willingly go out

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over the state to impart instruction, in conventions and institutes, to large classes of both young and old. Already they have demonstrated that largely increased benefits would accrue to agriculture were the proper room given them to work in, and were the requisite tools to work with supplied. And these can be supplied only by the Agricultural College—an institution separate and apart, where the idea of labor shall be uppermost, and where the *esprit du corps* of those instructed will seek highest honor in no other direction.

The University is a noble institution and deserves well of every citizen of the state. There is to be no rivalry between it and the college in prospect, unless it be in striving which shall do most to elevate the character of our people, and to promote the enduring prosperity of this great commonwealth.

I recognize the claims of our agricultural journals to friendly and commendatory notice, since to them must be attributed much of the progressive spirit that has animated and still possesses large numbers of our farmers. Too high praise can scarcely be awarded them, and our brethren can scarcely help themselves better than by bestowing upon these journals the most generous patronage. In their columns are recorded the various discoveries science is constantly making, and they keep us informed as to what is being practically done in the pursuit to which we are devoting our energies and our industry. Here is our own state paper, each number of which in real, practical value is honestly worth a great deal more than the subscription price for the year, and that farmer is poor indeed, and ought to be poorer, who does not avail himself of the information it contains as to the experience and observation of our most scientific farmers, the prospects of crops and the conditions of markets, together with a host of facts all important to be known and understood.

Mention is also to be made of the important aid agriculture has received from other industries.

The mechanic arts have come in to help the farmer in his plowing, and sowing, and reaping, and in all the many op-

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erations of the farm, by making his two hands count twenty hands, and shifting the tax of human muscles to muscles of steel and iron. Through their instrumentality our agriculture has been completely revolutionized, and the proportion of manual labor employed in its operations reduced to the lowest minimum ever attained. Take the one instance of the reaper. First it performed the labor of a half dozen, and then of a half score of men. After a while, by the aid of a self-raker, it did the work of others still. At last invention completed what it had begun, and the same machine facilitated and economized the harvest work by not only reaping and raking, but by instantaneously binding the grain into bundles.

There are those here who can remember how hard and slavish used to be the work upon the farm before the advent of agricultural machinery. In the house and in the field alike, all were driven to the perpetual toil of hands; no time to read, and but little rest of body to think. It is very different now. Men and women have been largely released from the drudgery and slavishness of the old-time farm life, when we had only the sickle, and scythe, and flail, the weekly paper and home-spun linen. And out of this release has come a new mental activity, and therefore progress along industrial, educational and political lines.

Our agricultural outlook is full of promise because of what has been well styled political agriculture, an agriculture that drives the plowshare underneath wrongs, oppressions and falsehoods, whether ancient or modern; that cultivates the primaries, cleans out the foul corners, unearths fraud, and deposits clean ballots as it sows clean grain. "The modest reserve of our rural population," said the Commissioner of Agriculture, "has heretofore barred the great interest of agriculture from its proper prominence in the legislation of the country; while other interests, more active and clamorous, with the advantages of association, abundant means, and concentrated effort, have often secured special protection at the expense of the farmer. Unfortunately this disinclination to self-seeking, and lack of ambition for public station, have resulted too gener-

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ally in the selection of legislators, state and national, from towns and cities, and from other avocations, some of whom have little knowledge of the peculiar wants of the farming class, and many others may have connection with other interests that may be brought into frequent antagonism with those of agriculture. Gradually this bad condition of things is being reversed. Farmers are learning their power, and are beginning to exercise it in self-protection, if not for their own advantage; and their interests are now more clearly understood and more fully represented in legislative councils than ever before.

Now, I will conclude with briefest mention of the society, under the auspices of which this convention is held, of its work and worth. Its influence in promoting the great farming interest of the state, and, therefore, in promoting all other interests, through the thirty-six years of its existence, can scarcely be estimated. Continually enlarging its operations, aided by branch associations, by sectional and auxiliary societies, it has been the means of greatly improving our agriculture, and has helped "to elevate the character and standing of the cultivators of the soil." Its publications have been awarded the highest merit, and come to be sought by leading farmers in all parts of the Union. It has given us this annual convention, into which it gathers the agricultural wisdom of this and other states, and has shown by means of it, that "the principle of association — the practice of bringing men together for the same general object, pursuing the same general end, and uniting their intellectual efforts to that purpose, is a great improvement of our age." Through its agency, I have no doubt, those who till the soil, or are employed in pastoral pursuits, have been made wiser and better, and more than any single instrumentality, it has helped to brighten the agricultural outlook in Wisconsin.

The President — The question under consideration is a motion of Mr. Broughton to express the sentiment of this convention favorably to the passage of bill No. 84, A. You

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will therefore confine your argument as near as may be to this resolution.

Mr. Hinton — *Mr. President and Ladies and Gentlemen:* More than sixty years ago in my native land I remember reading of a venerable American statesman whose learning, whose eloquence, whose force of expression, whose capacity for imparting correct information was so great that it was common when he addressed assemblies that, at the conclusion of his remarks, they immediately moved an adjournment, so that the good impressions he had made should remain latent in their minds. My venerable friend here has called that incident of my childhood's days to my mind. I have heard a great many great men speak. I have heard this subject of agriculture discussed in every form. I have once in a while taken a hand in certain subjects that I thought bore relation to it. I have been an attentive student; I have learned a great deal, and, as I listened to the tremulous but silvery sentences of this venerable gentlemen, I have experienced a pleasure such as I have no doubt you all experienced. Such an address as that is like that saying you know, where apples of gold are set in pictures of silver. It has been one stream of instruction from its beginning. There has not been one single feature in its current that has not trickled with beauty like Tennyson's "Brook." I doubt whether any lady or gentleman will leave here this afternoon but will be better instructed and have a higher opinion of agriculture from the very learned exposition which the venerable gentleman has given us.

Mr. Carr, Master of Wisconsin State Grange.—*Mr. President, Ladies and Gentlemen.*—The President has said that we must confine our remarks strictly to the question of this agricultural bill, so that what little I have to say to you will be in regard to that, and that alone. I would like for a moment to criticise a little the paper of my excellent friend, Mr. Sloan, where he says that in agriculture there is nothing more to learn, or something of that kind. Brother farmers of the state of Wisconsin, have you got to that point that you have nothing more to learn? I think not. For forty-six years I have been a tiller of the soil of this, the Badger state, and

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in the county of Rock for ten years and over. I belong to the order of Patrons of Husbandry, and it is well known to you all that have read our declaration of principles that education is the foundation rock upon which we are based. Therefore, gentlemen, watching closely for the last ten years the education of my own neighborhood, my own town, county and state, and for the last four years the agricultural college which has been mentioned here, one year ago last November. Visiting Michigan agricultural college on my way east, stopping over one day, going out three miles from the city of Lansing, there, entirely by itself, I found a city of buildings, six hundred and seventy-four acres of land, over two hundred students, and all the professors that were needed to carry on an agricultural education. They think over there they have something to learn. I went on to Canada. I found there four hundred acres and over, with about two hundred students. I went on to Amherst college in the state of Massachusetts, and there I found a similar state of things. Coming back here to my own adopted state, visiting again where I had done time and time before, our little farm where we have now eight students, I thought, "is not this a great state of affairs for us? For seventeen years we have tried to build up an agricultural college, and as it has been said by my venerable friend, the students we have graduated could be counted upon the fingers of one hand." Such is the fact. Now, with about twelve thousand acres of land that is left unsold, shall we, the farmers of the state of Wisconsin, longer take back seats? Come up to the front where you belong. You have taken back seats long enough. Let us not only ask, let us demand of these our servants, in this house and in the other, that they give us an agricultural college, where those of our sons who wish to take an agricultural education can go and fit themselves for that. If they choose to go on from that into our university here, I cannot say anything but kindly words, let them go on; if they choose to be lawyers, let them be lawyers; if they choose to be doctors, let them be doctors; but for those that want to come back upon the farm give them an agricultural education. (Applause.)

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Mr. J. M. Smith — I want to make a very few remarks, I will be just as brief as possible, in regard to some things that my friend Sloan said. The agricultural college land grants were failures, and why ? Previous to that grant, as is well known to all, there had been no efforts made to have agricultural colleges in this country, and but very few in any country; but very little had been done in any organized manner for agricultural education. It would have been strange if there had not been failures made in connection with it. The fact is that the grants were turned over to the states by congress, and the legislatures of the states, not knowing what to do, as a general rule did as we did in this state; they turned it over to some institution of learning, some college or university. I do not blame the regents of the universities or the faculty. They did no doubt as best they could, but we will own that it has been a failure. That is a fact, upon all hands, as a rule. There is this important fact in connection with it: Wherever the agricultural land grant has been given to colleges or universities, scientific institutions, and they have remained in connection with those institutions, with the intention of establishing an agricultural college, they have been failures; that is, almost, and, I believe, quite universal. I do not know of an exception. On the other hand, whenever they have been started alone, as far as we can ascertain, they have been reasonably successful. There have been mistakes in this line. There is no doubt about that. We are willing to concede it. There will be mistakes made in the future. But is that a reason why we should do nothing, why we should make no effort to do anything. Must we sit down and sit still simply because mistakes have been made, and perhaps will be made in the future?

My friend, Mr. Sloan, doubts whether there is such a thing as agricultural science. If there is not any such thing it is time that there was. Let us go to work and do something to put agriculture upon a scientific basis, and let us do it at once. It would seem to me, while listening to my friend Sloan, that he thinks there has been no such thing as agricultural improvement. It cannot be possible that he has

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not read and studied Macauley's History of England, showing the condition of agriculture in England some two or three hundred years ago. He must know what the condition of agriculture was in this country one hundred years ago, and what it was in Europe, and to say that there has been no improvement—such a man must be crazy. What we want is something to gather this learning. We want to put it in a crystallized form. We want to put it where the improvements that this man and that man and another, either in this country or in Europe, make, can be gathered together. We want to get it in some place where our young men can get it. We do not want to have to hunt for it in fragments all over God's world. At one thing that my friend said in regard to drainage I must say I was astonished. He objects to drainage on the ground that it creates both flood and drouth. I do not know where he got that information from. I have tried to keep track of the general knowledge of the country, but that was too much for me. I give it up. The fact is, and is well-known, by every student of drainage and every practical farmer, that, other things being equal, the land that is thoroughly drained is ready to work from one to two weeks earlier in the spring; it will resist frosts later in the fall, and, as a rule, it has from two to three weeks more growing season in our climate than land that is not thoroughly drained. If my friend Sloan does not believe that, if he will come to me next spring I will convince him of the fact upon my own drained lands. As to this drouth, he is simply mistaken; that is all there is of it, and all there is to it.

My friend from Pewaukee proposes that we shall turn the farm upon the reform school into an agricultural department. Mr. President and members of the legislature, the farmers of this state are not prepared to descend either to the reform school nor to the insane asylum. We ask you to give us an agricultural college and we will agree that we will antagonize no other institutions. We want it understood distinctly that we are not antagonistic to the University. I do not know of a man who would raise a hand against it, and surely I would desert at once any

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attempt to get up an agricultural college, if I supposed it was to break down or injure the university on yonder hill. Let it be understood distinctly, they are a part and parcel of the educational interests that are a necessity to our state. We must sustain them, but in sustaining them, I do not think we need to refuse to sustain the agricultural college.

Dr. Juliet H. Severance, of Milwaukee — *Mr. President, Gentlemen and Ladies:* I hope, friends, to live to see the day when there will be no conventions, in all this land where any speaker will rise up without addressing ladies and gentlemen. I hope to live to see the day when there will be no school in all this land that is not open to men and women, agricultural and all; and, furthermore, I hope to see the day when all legislation against the interests of the laboring people will be wiped from our statute books. When that day comes, there will be no lack of young men in agricultural colleges, for it is from the fact that our legislation has been in the interests of almost everything else than labor, that people do not find such labor profitable, and, hence, instead of going to the agricultural schools, they take up any kind of profession, or even lightning-rod peddling, or anything else whereby they can make money. Look at our agricultural condition in the western states, where they are obliged, because they cannot go to market without more than using up their products, to burn their corn for fuel, whereas, our coal in the east that should be shipped there, lies in our eastern markets. And why? Because our legislators are legislating in the interests of corporations all over the country, in the interest of money and against the interest of labor.

We must create a public sentiment which places the producer above the capitalist everywhere in society, as Abraham Lincoln so justly said, "labor is higher and above capital"; labor existed before capital existed, and capital exists by virtue of labor, and hence laborers should always receive the highest consideration. When that public sentiment prevails, our young men will not be flocking to the other professions, instead of taking up the labor of tilling the soil

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or raising stock, or anything of that kind; productive labor will stand high in the estimation of the people; but before that time comes there must be a doing away with this legislation in the interests of monopolies. We must have schools, as has already been said, where our young men will be educated in the science of agriculture, and that school must be, in my opinion, by itself; especially so long as there is the distinction that exists to-day whereby public sentiment places the school that has culture of the head and not of the hand above the one that has muscular education and culture of the hand as well as the head (Applause). Now, gentlemen, and ladies, I wish to say that in my opinion, much as I prize the work of the university, in order to do anything that will be a grand work in the agricultural education, we need a college separate and apart from the University, because of the sentiment that prevails that gives a university student a little higher grade, in the estimation of the people, than an agricultural student. So long as that public sentiment exists, these schools must be kept separate. When the one stands exactly equal with the other, in the estimation of the people generally, then it might do to have them together, but not till then. So I hope that the bill will certainly be carried whereby an agricultural school will be established by itself, separate and apart from the University, and I hope you men will see to it, when that school is started, and every other school, that it is not just for man. Remember women are on your farm. Remember that they have as much to do in the farm work, so far as everything that concerns its success is concerned, as the men have.

One thing I wish to criticise a little, and that is this: It always gives me a kind of a sick feeling when I am attending a convention and a gentleman gets up and accidentally, or incidentally, or from a sense of courtesy, alludes to the women, he at once puts on a kind of a simpering tone, as though he was going to talk to a baby instead of a person that is his equal and should be so recognized everywhere in society. Where do you expect intelligence on your farms unless the mothers of the farmers have intelligence? Are you men that have reared cattle and stock of every kind so

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ignorant that you do not know that its pedigree determines its intelligence and its qualities in every way, and is it not of equal importance that the farmers' wives be educated that it is that the farmers themselves are educated? Certainly it is of equal importance, and should be so considered by every intelligent man everywhere throughout the land. Now, with all the wonderful improvements that have been made in rearing horses, whereby you know that no one can hardly estimatethe changes that have been made in that respect in the last twenty-five, thirty and forty years, and in all the different stock products of the farm. Look at your children, puny, sickly, never thought of. It seems to me that the children upon the farm should have as much attention as the horses and the cattle and the hogs. (Applause.) When women are cultivated in all these departments the same as men are, when they have equal liberties everywhere that men have, when they are not relegated to home and home alone and flattered with the idea that they are queen in the realm of home, when they are never queen except when the king is gone. (Laughter.) It is nonsense; we want to be addressed as intelligent human beings the same as you are. No flattery, no particular attention, but merely, simply, equal justice everywhere in the world, and in agricultural education, as well as anywhere else. Then your sons will go to agricultural schools when the girls are educated there as well as the boys (laughter and applause), and they should never go until they are so arranged.

It is a principle that should be recognized every where in society, that neither women nor men, nor boys nor girls, can be so well educated alone as they can be jointly in every department. One of the oldest sayings, and said to be by one who would be supposed to be pretty good authority, is, that it is not good for man to be alone (Laughter), and I thoroughly believe that, and I know from experience, it is not good for woman (Laughter), so let us work together unitedly to better the condition of the human family in every department of education, including agriculture with all the rest, and study to understand how those conditions can be brought about, and among other things understand the polit-

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ical affairs of the country, and try to have legislation that will give all a fair and equal chance. I do not ask legislation particularly in the interest of the farmers. The best legislation that could be done for the next five years is repealing legislation. We have had legislation in the interest of this, and that and the other monopoly. Do away with all legislation to favor any special class, and every class will take care of itself. (Applause.) I hope, friends, that you will all be successful in this undertaking to raise agriculture to the high platform where it naturally belongs. But the one great mistake that the Grangers have made, and I wish to refer to that, is, that they started the Grange movement asserting that they were not going to have anything to do with legislation. Now, we can never forward any of these Grange movements except through legislation. The lever to use to bring about these reforms is legislation. Legislation is back of these things, and back of education, intelligence. When we have intelligence and education, we will then give every individual man and woman a fair chance for cultivating every faculty, an equal opportunity to exercise their faculties in any and every department of life, industrially, educationally, and in every other way. (Applause.)

Mr. Sloan.—I only desire to say a word, and that is to correct an evident misunderstanding of my remarks. My friend Carr understood me to say, in the hurried reading of my paper, that I thought agricultural knowledge had attained its utmost limit, and therefore there was nothing further to be learned. I did not intend to convey that idea, and Mr. Smith seemed to understand that I claimed that there had been no progress in the knowledge and processes of agriculture since the days when England emerged from barbarism. Now I am conservative, but that is a kind of conservatism that I do not adopt. I believe there is to be great progress in this country yet in the knowledge and method and processes of agriculture, as there has been in England, in France and especially in Belgium, where they support three times as much stock and population on the same quantity of land as they do in this country. I only

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desire to say, in saying that I thought popular instruction and investigation had been carried far enough, I said I was in favor of experiment farms and experiment stations, of the application of chemistry, of the investigations of botany, in regard to the products of the farm. I firmly believe that in the experiment farms which have been established in all other States that that particular line of progress has been carried far enough, as far as useful and proper, but I expressly said I am in favor of continuing those experiments, but I do not expect, and I believe whoever does expect it will live to be disappointed, to have this agricultural progress derived from instruction in school. As the population of the country becomes more dense, people are carried forward by their own energies and own interests to better processes and methods of cultivation, and larger production of the soil, and that is to be the course of progress, I think, in my opinion. My friend says he does not understand that any agricultural college established under the land grant, except those connected with universities, have been failures. I ask my friend if he is familiar with the agriculture college and farm of Illinois. It has always been a separate institution, on a large farm, with a large corps of teachers, and, so far as I can learn, it has been confessedly a signal failure in attempting to instruct the youth of Illinois in the knowledge of the principles of agriculture.

Mr. Smith — Is that an agricultural college or a scientific college?

Mr. Sloan — Agricultural purely. I am very sorry that Mr. Smith, one of the most intelligent men in the State, has never heard of the theory that was so generally discussed in the papers, that that great and disastrous flood in the Ohio River, sweeping away millions of property, and sacrificing a great many lives, was largely produced by the extensive system of drainage which has been adopted in the states of Indiana and Ohio, carrying all the surplus water immediately into the Ohio River, instead of allowing it to remain and percolate in the soil. Whether that is right or wrong I know that drainage has been said to be a great benefit to the land, but this theory is advocated and believed

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in by intelligent and scientific men. I simply said it is a theory for the purpose of showing that knowledge was unsettled upon that question, and the man who should attempt to teach it would be teaching, not settled and established principles, but doctrines that were controverted and disputed by intelligent and able men.

Mr. Phillips — I only wish to correct a statement made by Mr. Sloan, and I do it with a great deal of trepidation, for I honor and respect, from centuries of education, the profession which he represents to a degree that is not expected to be accorded to the industrial classes. For centuries they have been favored ones.

They have been educated at the public expense, and they are supposed to have a science in their profession which the learned gentleman says is impossible, he thinks, for agriculture. He thinks there is no science possible in agriculture. There are no professors that understand a science pertaining to agriculture, etc. The impression that I wished to correct was in regard to the Illinois State University and Agricultural School.

I have a friend and near relative who lives in Champaign and has lived there ever since the university was established, and a few weeks ago I wrote to him a letter, making inquiries in regard to the history of the state university. He informed me that the agricultural college and the university were connected, and all under the control of the same board of regents; that it had always been a failure; that young men and young women, starting in the agricultural course, were so discriminated against, so ridiculed, and so worked upon by argument, that, before they got half way, it was the universal case that they departed from their intentions, abandoned the agricultural course, and went into the classical department. All the influences of the institution are brought to bear to deter young men from going through the agricultural course. He further said that many farmers throughout the state were dissatisfied with this state of affairs, and were desirous of having the agricultnral college department separated and planted in a different locality, and thought some of the

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professors were in favor of it, for the reason that their school had the reputation now of being merely a plow boys' school. It seems that there, in the state of Illinois, they are laboring under the same disadvantage that we are here, with no greater success, and I deprecate very much a quotation on that state, as an instance of the failure of an agricultural department separate and apart from a university. That statement is all that I wish to correct.

Now that I am here, I may state perhaps some other reasons that have led me to espouse a separation. We conferred with the board of regents in regard to that project, and the sentiment seemed to be universal among the board and the friends of the University to hold on to the congressional endowment granted by congress in 1861, or 1862, to promote agricultural and mechanical education. They seemed so disposed to hold onto that, that we quietly framed our bill so as not in the least to interfere with the University, or any of its departments. They do not propose to allow agriculture to have an institution. They evidently do not think that the farmers of this state are capable of judging what they need in the line of education for their sons. I am sorry to see this spirit manifested. I think it is a need, growing out of the nature and tendency of our society and our people. We see the professions, which our institutions have carefully nourished for years, are full to overflowing. There are a hundred applicants in any profession where there is an opening for one. You put out an advertisement, at ever so humble a salary, for ever so humble an occupation, and you will have the next day thousands of applicants to fill the position, college graduates, gray-haired men and boys to fill the position of messenger boy, perhaps, in the city. It seems to me, gentlemen, that these various vocations that have the reputation for gentility, in which industry constitutes no important part, are overdone, and that we need to do something to encourage the young men of the country to engage in industrial occupations, especially in that of agriculture. With that view I have had the honor to be associated with several practical agriculturists in drawing up a bill to establish an institution to teach practical agriculture.

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In that bill, we have not entered into the details of the matter. We have arranged for the appointment of a board of control, a board of regents, or trustees, to designate the course of study, the character of buildings, and all that pertains to the proposed institution, and we thought perhaps, if it is true, as the learned Professor says, that there is no science of agriculture, perhaps this demand, so prevalent all over the state, is an indication of a function which calls for an organization. I understand from naturalists that function often precedes organization in the animal body. Perhaps this is a function which has just begun to exercise itself, and if there is no such thing as scientific agriculture, it is time that there was, in my opinion, and the sooner we start it the better. I live in the country, and I am a farmer. I have hitherto, before hearing this learned dissertation on the humbleness of agriculture, taken considerable pride in my profession. I have thought it was one of those occupations which had a tendency to develop the highest type of manhood. Indeed, President Paul said, in the report that has been recently made, that the various high avocations, such as that of learned professors, learned lawyers, learned doctors, theologians, and successful commercial men, are largely composed of men who were reared as boys on the farm. That shows us that, if we have not any science in agriculture, we have been pretty successful in rearing men. I have noticed, living in the country, that most of the sons of farmers, through the influence of our present system of educational institutions, drift off into what are called the genteel pursuits, and that their places are taken, by the humble peasantry coming from foreign countries. They come to this country with very humble ideas. They commence work at whatever salary they can get, and I have noticed in a very few years they get possession of the farm. They have been progressing rapidly in that direction within my memory, for the last twenty-five or thirty years, and they are getting most all of the country in their possession, while the sons of American born citizens have drifted off into these pursuits that are supposed to be genteel, and in which physical exercise is not required as it is on the farm, and

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after a generation or two they somehow die out and disappear, and the current keeps running in this way.

Mr. Wood.—I think a false impression has been made which it is well to correct. From many of the remarks that have been made, it would seem that the proposed college is intended exclusively for the children of the farmers of the state, and it is proposing a class legislation which would be very distasteful to a great many. It ought to be distinctly affirmed that it is not intended for the education of farmers' sons and daughters exclusively, but that it is open to the sons and daughters of all the state equally, and it merely proposes to shape the education in a particular direction. The agricultural interest is not the exclusive interest, while it may be the largest interest, involved. The bill is for the education of those intending to follow agricultural pursuits, and these youths may come from all classes and kinds of people in the state. I object to the bill in this particular, that it insists that regents shall be appointed of two practical farmers. It would be pretty tough to ask men who represent other interests to vote for a bill, and the appropriation of the state money, and yet have them, by the terms of the bill, cut off from all representation in the expenditure of the money. I think that if the bill should be passed without that restriction, it could be left to the good sense of the people of the state and the appointing power. I am sure no man would accept that position who was not friendly to the object of the bill, and I think, if anything went wrong with the institution, it would be a great benefit for the agriculturists of the state to have men from other occupations have a hand in the control of it, and not have the failure come entirely upon the agricultural people of the state. I would like it better if that restrictive clause were removed.

Mr. Clark.—We would like to hear a few remarks from Mr. Hill, who lives in the state of Illinois, and who knows something of institutions of this character in foreign countries.

Mr. Hill, associate editor of the National Live Stock Journal.—*Mr. President and Ladies and Gentlemen.*—I put my foot into it. I made a remark to this gentleman along side

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of me, and now he wants me to make it to all of you. In regard to the assertion made by one of the speakers that agricultural colleges had been tried for a long time in older countries and had been found unsuccessful, my remark was that I knew of no country, although I had recently studied very carefully a report on the agricultural colleges of Europe, procured for the General Department of Agriculture at Washington, I knew of no country where they had existed but a very short time. The truth of it is that agricultural colleges stand to-day about on a par with colleges of veterinary science a little over, or about, a hundred years ago, when it was the greatest term of opprobrium you could apply to a man to call him a horse doctor, and a great many people inferred that because the science was in a comparatively undeveloped state, animals not having received the attention that they ought to have received, that therefore there was no such thing as a science. Something of the same remark was made in regard to agriculture. If we say that there is no such thing as a science of agriculture capable of being taught, we might almost say the same thing of medicine, for the reason given; for instance, that there is a doubt as to line breeding and in and in breeding. Why could not we say the same thing of medicine at the time when the germ theory was started, when the old school doctors threw up their hands and said, "confound those fellows, it is going to be a microscopical profession," and rather ridiculed bacteria; and rhymes were published on the absurdity of bringing medical science down to the microscopical science.

Now if a man learns that a certain crop takes the nitrogen out of the soil, it is also worth his while to learn what will restore it to the soil. It certainly will not make a man a worse farmer to do that. I am glad that this gentleman spoke about that not being a class institution. I know a great many men living in cities, bankers and manufacturers, and merchants, who would be glad to send their sons to an agricultural college where they would learn to be good farmers. I heard a young man say to his grandmother, "I would like to be a farmer." His grandmother said, "What!

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would you be willing to be a common farmer?" His reply was pretty good for a lad of fifteen. He said, "No, I want to be an uncommonly good farmer." The difficulty with that boy's father was where he was to send him. He investigated the agricultural college of Illinois, and he shook his head and concluded he would have none of it. It is an agricultural college and university combined. They tried to pass a bill, a few years ago, to knock the word "industrial" out of it. They put in, to run the college, a doctor of divinity, a very excellent man, whose idea of a college was granting Bachelor of Arts and Master of Arts degrees, and they do grant Bachelor of Arts and Master of Arts degrees. In spite of all the trouble they have had, two of the most successful men in practical farming that I know were men who withstood all the temptations to leave the course of agriculture in the agricultural college, and stuck to it, and graduated from it.

Mrs. Severance.—I wish to just reply to the criticism of the gentleman from Baraboo, in regard to having the regents farmers. Who would object, in starting a medical school, to have the regents physicians, or, in a theological school, to have them doctors of divinity. It is eminently in place that they should be farmers, and only by keeping them farmers will it ever be a success as an agricultural school.

Mr. Wood.—Remember that this is a state institution. We have a school of law, but it is not required in the organic law that the regents of this university shall be lawyers.

Hon. Mr. Adams—I cannot speak on this subject, because I have not been here this afternoon and listened to the discussion. I am not aware what points have been made for this bill or against it, and I do not wish to go over anything that has already been gone over. I simply arose for the purpose of saying one word with reference to the point that was made by Mr. Wood, of Baraboo, against this bill. It is a point which seems to me to be a good one. The bill was drawn by a committee of farmers, appointed by a convention of farmers called to consider this subject of agricultural education, and presented to me to be presented to the

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legislature. I am not the author of the bill. I indorsed its provisions, that is, the most material provisions in the bill, but it seems to me that the objection which Mr. Wood has made is a good one. I informed the gentleman who brought that bill to me for presentation that I should be the first man to amend the bill in that particular respect. It seems to me that there is an eminent propriety in having men in different avocations upon the board of regents of the agricultural school. The object of that school is to reach all the people of the state, the children of men in different professions, and it is perfectly fitting and proper that those interests should be represented upon the board of regents. It is perfectly proper that we should have a lawyer upon that board, and have the benefit of his legal advice and his knowledge upon those questions which come up in any such organization. It is desirable to have business men upon that board, and I have no doubt that, if this measure becomes a law, it will be amended in accordance with the suggestion which Mr Wood has made.

I do not wish to enter into a general discussion of this measure. I only desire to say for myself that it seems to me that it is simply an addition to the educational force of this state. I do not understand that this is an institution which will be in conflict with any other institution, or which will enter into competition with any other educational institution. I believe tnat it is a school which will reach a special class of men who are not now reached. It seems to me that the state of Wisconsin is abundantly able to provide this school. We have plenty of money in the treasury. It is not necessary for us to squander that money in useless undertakings, but it seems to me, where there is a great need of education expressed by a certain portion of the people of this state, that the interests of that portion of the people should be fully considered. I am one of those who believe in higher education, and I have never hesitated in frankly stating my opinion upon that subject, but I understand that there is a large proportion of the farmers of this state who have not the same faith in that higher education that I have, and I trust that I am charitable

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enough to those men to give them what they ask in this direction, even if my views in every respect do not coincide with theirs. There is a strong sentiment, I see it more and more in Wisconsin, towards agricultural education. That is a growing sentiment. It is very strong, and the people who believe that agricultural education is just what they want, are a class of men who pay a large portion of the taxes of this state. I do not want to go into an elaborate discussion of this. I will have an opportunity later, but want to say to the farmers that are gathered in this convention, if you want this measure to pass it will pass, if you express your opinion in any unhesitating way upon this subject.

Mr. Williams.—I do not wish to say but a single word on this subject. There is no gentleman in this house that feels a deeper interest in the question of agricultural education than I do. There is no one that is more earnest that the people of the state of Wisconsin should adopt the means of securing the best possible system of education than I am, and in a few words I wish to say this has seemed to express my views as to what I believe will accomplish the greatest good in this respect. I met the professor of mining engineering in Columbia College this summer in New York. He takes his class, four months in the year, into the field, and works from eight o'clock in the morning steadily until five o'clock in the afternoon, teaching them the practice of mining engineering. I met an engineer this summer that was out in Dakota running a railway line. The boy had never been to school except to learn how to merely add and divide. He was running a transit, and he said he had three college graduates in his company under himself. The real question to be discussed by the legislature of this state is how we can elevate, not simply the practice of teaching farm education, but the practice of general education, so as to make it more practical in every respect and to the highest possible extent. A theoretical education is good enough in its place, and to the furthest possible extent, at the same time, to make it absolutely practical. I do not understand that there is any difference between the fundamental principle of the education that is required for the farmer, the mechanic, a man or

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woman. I believe that the classes of education are common to us all, and the fundamental principles of education are the same, and our state institutions should be of such a character that the instruction there given is equal to any that can be given in any institution in this country, and if it is as good as any that can be given it is none too good for the farmer.

Our agricultural institution should be made the best there is in the country, and not left to one professorship of chemistry and a superintendent of the farm. We should have a corps of professors in that institution teaching veterinary surgery, animal anatomy and physiology, the various classes of insects and everything that pertains to the farm, the best talent that can be obtained in the United States. And when you add to that college professorships of the highest possible intelligence and the highest possible scientific ability, to teach the people, the farmers and every man interested in agriculture, the principles of agriculture, you will give your college a character and a reputation that is not found in any other agricultural college in the United States, and it will be an honor to your state. The farmer does not on his farm know simply how to hoe and plow, he needs to be a mechanic, as well as a sower of seed. A large proportion of our agricultural work is mechanical. We want, connected with our agricultural college, the best possible advantages for teaching mechanism. We have begun right here in Madison. We have started a scientific hall, where we have a good machine shop, where the principles of mechanism can be taught as perfectly as anywhere else in the world. Gentlemen of the legislature, you want to add to that department, you want to have the facilities not only to work iron but to work wood, to make shoes, to make cloaks, to make dresses, to teach the ladies how they can make their own apparel, teach every department of mechanics as well as farming.

Mr. Fish — When this bill was being framed, this one clause took a great deal of our thought. It was at first made to read that the majority should be practical farmers. It was afterwards thought best by some that it should be

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corrected to read that all should be practical agriculturists, but it was not determined at that meeting of the committee which way it should read. The committee dispersed and went to their several homes. After being home a few days, there was word sent to me by one of the committee that he should probably, in a few days, present this bill to a certain party to be presented before the legislature and wanted to know my views in regard to that clause. I sent word back to him to refer the matter to the gentleman who has the bill in charge, Mr. Adams, and others here, and, if they thought proper to make that change, to do so, and present the bill in that form. I am not satisfied at the present time whether it was wise to make that change or not. If it is not wise, it would be a very easy matter to change it back to read as it formerly did, "A majority of the board shall be practical farmers." I want to say, for the benefit of this lady who gave us such a splendid plea in favor of the agricultural college, that the petitions that were sent out, in the first place, were drawn up to read, "For the education of farmers' sons," confined strictly to the education of farmers' sons. I told them that would not do; we wanted it based on a broader field than to be confined to farmers; that our daughters should be also educated in that college; that I believed that our sons and our daughters should go hand in hand, be educated together in every respect, and not be separated; not only that, but the villages and the cities should also be allowed to send their children to this college, there to be educated in the branches that were to be taught there, if they saw fit to seek an education of that kind. The point that this lady made, that our daughters should also be educated in a college of this nature, is one of the most beautiful features, as I look upon it, of the whole thing. Let us send our daughters and our sons together, where corruption shall not creep in, for we know it is a fact that wherever boys or men are separated from the influence of ladies that they become more or less corrupt. If this institution is established, and both sexes are not educated in that college, it will not meet the views of the committee who had the framing of it in charge.

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Mr. Roberts, of Kenosha county — I think that this is a very important question. I think we ought to take more time to consider it. I think that we ought to take another year's time to think of it. I am opposed to the bill. There has been a great deal said about the low position that is occupied by farmers; they are not up in the world with the minister and the doctor and the lawyer. If you want to keep them there, establish a school purposely for farmers. I think that would be one of the surest ways to do it. If you want farmers' sons to take an equal position with every other occupation and profession in the world, let them be educated right along with those young men. If you have got a son that wants to be a farmer, let him come to the State University and study right along with the men that are going to be lawyers and doctors, etc., and then they will come right up with them, but you establish a separate agricultural college, and confine it to farmers' sons, and give them just a little smattering of this, that and the other, I think that you can just keep the farmers' occupation right down where it is now, perhaps get a little lower. I think you had better take a little time. I do not think you had better press this question on your legislators, and compel them by force to use so much money in an institution of that kind. It will pay to wait and find out just what we want. If we do want another school, let us wait; let us take time.

A Member — We have waited seventeen years already.

Mr. Roberts — You can afford to wait longer, because, when you do this thing, you must consider it well. I do not think we need an institution of this kind. I do not think there is a farmer that has a son that can complain that he has not equal advantages with any boy who wants to follow a learned profession.

Mr. True — It seems to me that the opponents of the bill under consideration look at it from a mistaken stand-point. It seems to me that the opposition from the first, commencing with the learned gentleman, Mr. Sloan, has been from a stand-point at least twenty-five years behind the present situation. At that time, a boy, to become educated, went to college, and there was one prescribed course of study. Latin

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and Greek were included in the course of study in all our first-class colleges. To-day our courses of study are so arranged that a young man, knowing what he wishes to do in life, can follow a course of study appropriate to the profession or calling that he chooses. It seems to me that this is just what the bill which we have under consideration contemplates. I claim that the farmer of to-day acquires as much intelligence, as much business capacity, as the man who enters one of the learned professions, or is engaged in what are called the business pursuits of life. And it seems to me that this bill contemplates giving to that class of students just what is required, and I hope that it will receive favorable consideration.

Mr. J. C. Ford—I feel like endorsing partly what Mr. Roberts has said about making haste slowly. I suppose I am naturally a conservative, but this whole discussion, as far as I can understand it, has gone on the supposition that the farmer, as a class, has got no college; that he is put under the shadow; that he has not the means of education. I understand that the common schools of this state, the high schools of this state, the normal schools of this state, and our grand University, are open to all, the farmer as well as everybody else, and I understand that the great complaint is that the mass of the students of this University are made up of farmers' sons, but those farmers' sons, when they come out of the University, go into the professions, and I understand the real complaint that we, as farmers, have, is, that the farmers, as a class, are not educated with these educated men; that they are not yet their equals.

We desire the profession, if we may so call it, of the farm, to be placed on a level footing with that of the professional man. What are we advocating here? We are advocating a higher education for the farmers. Do we wish to exclude them from the state university and the normal schools? I think not. Yet the question is how these men are to be educated. We want to turn the tide of these educated men back on to the farm. How is it to be done? Here we have the great farmers' university, and it always will be. This annual meeting is one of the best educators that the farmers

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have. The Dairymen's Association, and all the associations in special callings, are throwing a large amount of light on these special pursuits. The press of the country, the agricultural papers, the stock papers, the papers given to these special pursuits of farmers, are educating them all the time in the art of farming, more rapidly perhaps than any college. But still they do not answer the purpose. What do we want? We want men that have a thorough education back on the farms; we want to dignify the life of the country. We cannot do it by sending a man to the district school. You build up an agricultural college down on some obscure corner, with three or four, perhaps obscure, professors. If I understand, some of these gentlemen do not want these professors to be educated men. They want them to be merely practical men.

You start an institution at an expense of $150,000 or $200,000 and you get a course there, in a course of one or two years, about equal to one of our high schools, and those graduates go back to the farm. Are those men going to assume the respectability of men that graduate in the university, and have a thorough course of education? You are going to thereby stigmatize the agricultural profession. You are going to say that it is inferior to the other professions. You are going to say the farmers' sons cannot compete with other men. I deny it. I disagree entirely with Mr. Sloan. He says there is no science in agriculture. I regard it as an art. Take the university. There are professors of botany, of zoology, of mathematics, of history. Every one of those branches lie at the root of agricultural education. I would be ashamed to recommend an education inferior to that Every student if he is going into an agricultural education, has got to have education in those branches. Is he going to get it in two years? I want the farmer's sons to come up and meet these university men, and see that their calling is as high as the others; that it involves as much study, as much time, and that they should have the courage and manliness to stand up and say that they believe in their profession.

Mr. Broughton. I hoped this could be settled without any controversy; that the truth could be successfully used in

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order to get at the principles that lie at the bottom of this whole subject. It is a historical fact that can be substantiated that the industrial class, in all past ages, were not allowed to know only just enough to make them competent slaves, and if any of them showed a natural gift to get out of that class, and get a higher education, he was invited to join the ruling class and get out of the industrial class. It has always been considered that it was dangerous to a government to have the industrial class well educated. There is another thing about it. Farmers should be so educated that they could face the lawyers or the college students or the professors, or any thing of that kind. But there is this thing about it. All the farmers should claim is what rights, privileges and immunities are safe for them and safe for the community. If it is unsafe for the government to have them have privileges, they should not have them. It has been thought by governments in past times that it was unsafe. Consequently they have not had that education. If any of them happened to get it, he was invited to join the ruling class, which is considered twenty per cent. and the industrial class eighty per cent. Between 1870 and 1880, the lawyers, doctors and ministers increased sixty-five per cent. while the general inhabitants only increased thirty per cent. The great question is, what shall we do with so many of them. The farmers should claim the prerogative of managing themselves; and if any man or institution stands between them and the management of their own affairs, they ought to say "get out of the way," and they should say it successfully. The argument of these gentlemen is to send them to the university. The fact is that would be educating them away from the industrial pursuits forever. If you want to have your boys educated in that way, let them go, but I do not want mine to be educated in that way.

Knowledge is a good thing but the wisdom that applies knowledge is better. Friend Barry speaks of this conservatism that says, "Hold on, wait, the old way is good enough." Mankind are governed by traditions. They seem to hang to the past, to an ancient age. In politics they are called barbarians. Mr. Barry seemed to understand the whole gist

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of the thing. We want to disseminate knowledge among all classes, especially the agriculturists. They have been persistent all over the world in seeking to obtain natural rights that belong to them; hence you see the danger of losing them. Something of that kind is constantly in danger then. Why? Because they know of no way of getting even with their oppressors. It is very important that the industrial class, who have to defend their rights for themselves, should have the knowledge to do it. The legislation and the administration of all governments from Babylon down have been favorable to cities, and if that system is to continue over the agriculturist they ought to have some power of getting favors equal to the most favored.

Mr. Sayres — It seems to me that the limitations the gentleman made need to have another limitation. He says that the object of the agricultural school is not higher education. No, sir. It is higher education so far as the objects of this bill are concerned. It is a higher education in the direction of farming. That we do not get at the University. Again and again it has been said this afternoon that our boys have the same privileges as other boys; farmers' boys can go to the University; they stand there on an equality with other boys. Let us see. If you go to the University, there is a school there to educate in the direction of mining, of civil engineering the same, and if a boy wants to go there and take a four years course, and then wants to go into law, there is a school in the direction of law. Is there any school in the direction of agriculture? I do not know it if there be, so that I think the limitation needs to be made that we not only want a higher education, but a higher education in the direction of farming. He says this convention is a school of education. Is it for the boys? Where are the boys? My boys are on the farm. We have left our boys at home and come up here for education. We want a school where we can send our boys, where they will be educated in the direction of farming, and not wait any longer either.

The question was then put on the resolution of Mr. Broughton, and was adopted.

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Professor Trelease offered a resolution that the convention favors the passage by the legislature of the bill No. 96, A., establishing a state weather service. Referred to committee on resolutions.

Mr. Wm. Guile offered a resolution relating to reform in the management of public highways.

AGRICULTURAL EDUCATION.*

BY I. C. SLOAN.

Is a subject which now occupies the attention of large numbers not only in this state but throughout the country. I have chosen it as the subject for a paper, not with the expectation that I shall furnish any valuable information, but in the hope that I shall awaken discussion and investigation.

To guard against misconstruction, I desire to say that I feel a deep interest in the advancement of agricultural knowledge, and would heartily favor the appropriation of money to any amount which I thought would in any considerable degree lead to the better education of farmers or would promote the more intelligent and profitable pursuit of this important branch of industry. So far as I may indulge in criticism and the advancement of discouraging views, I beg of you to remember that they are offered in no unfriendly feeling toward this great primary industry, but on the contrary, in the hope that they may lead to more practical and valuable results in any expenditure which the state legislature may be induced to authorize toward the accomplishment of the great end we all have in view — the better and more profitable cultivation of the soil.

In the first place I think I am justified in asserting that the agricultural colleges which have been established in this country by the aid of the public lands granted by Congress to the several states for this purpose have not accomplished

*See discussion and minutes on page 249.

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the beneficial results which were anticipated from them at the time the grants were made, but that all of them, whether established in connection with state universities or as separate institutions, have been substantially failures so far as imparting any knowledge which has been of much practical value to the farmers of the country. I am aware that some of them have been quite successful as high schools where the general branches of education are taught in their lower forms—such an education as is useful in a general sense to men intending to engage in the various avocations of life, trade, commerce and the other industrial pursuits, that is to say they have been successful in securing a very respectable attendance in numbers of students. Of this kind of success I believe Michigan and Mississippi are two of the most favorable examples, but this kind of success is such as might be expected of any schools offering the advantages of a free education having no connection with agriculture. In this country where there is such a mania for education any college or school offering free tuition and teaching the various branches supposed to be necessary for an ordinary education will not fail to secure the attendance of a respectable number of students, but this is not giving to students an agricultural education, and in this state the facilities for obtaining a free education in all the various branches of scholastic learning are so great and the burden of taxation in maintaining our system of free schools, from the district school through all the various grades of high schools up to the State University, is so onerous that I presume none would be in favor of establishing another expensive institution, the object of which was to simply offer additional facilities for a general education.

What we want to do, if practicable, is to have some institution where instruction is given in the science of agriculture, provided there is any such science capable of being taught.

There is a feeling prevailing among farmers to some extent at least, that they are not fairly dealt with as a class; they say there are special colleges and schools where a knowledge of theology, law and medicine can be gained,

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but none where agriculture is successfully taught; that farmers, as a class, are suffering from this discrimination against them, and that it is time a remedy was applied. They think that farming is at least as meritorious a pursuit as any of the so-called learned professions; that farmers suffer in the weight of their influence in the social and political circles for want of those advantages to obtain an education in their calling which ministers, lawyers and doctors possess in theirs. And now they are calling on the legislature to remedy this unjust discrimination against farmers by making a liberal appropriation for the establishment of a separate and independent institution where the science of agriculture will be taught and the art of farming be thus elevated into a learned profession and thus placed on an equal footing with theology, law and medicine.

If this can be accomplished by the appropriation of money it is an appeal which should not go unheeded by the legislature, but I think they are asking an impossibility. What reason is there to expect that an institution of the kind asked for in this state would be any more successful than those which have been established in other states. When the advocates of this measure can point out any general benefits to the farmers in the practical work of carrying on their farms, gained from the teachings of similar schools in the other states, or in foreign countries, where so many of them have existed for long periods of time, maintained at great expense, it will be time enough for the legislature to take into serious consideration the expediency of establishing such a school in this state.

The truth is that agricultural knowledge has never yet assumed the form of a science, and whether it can ever be reduced to the general established principles so as to be recognized and practically applied by all good farmers, is extremely doubtful, but one thing is certain, that until it is, all attempts to teach must inevitably result in failure, for the simple reason that there is nothing to teach, but if there were, there are no means such as books and appliances for teaching, and if there were, there is nobody so far as at present discovered, qualified to teach agriculture as a science,

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and the question is now presented whether it is worth the while of the legislature to add another failure to the many that are scattered through the other states.

What is the plan proposed by the gentlemen who have volunteered to take this project in charge in behalf of the farmers of the states. So far as I understand the same, they propose to have the state acquire a farm of five or six hundred acres, to erect buildings at an expense of say $100,000 to commence with, expend $50,000 more in fitting up the premises, purchasing stock and implements; employ say half a dozen professors and teachers, a proper number of foremen and laborers, and then invite the sons of the farmers of the state to attend and receive an agricultural education, which shall fit them to become successful farmers But when this point is reached the question is what are they going to teach their students. Is it to be manual training in the practical operations of husbandry; are they to be taught how properly to feed cattle, milk cows, use agricultural machinery, plow, sow, plant, reap, and secure crops, make butter and cheese, raise stock and market the products of the farm. While instruction in all these things is no doubt useful and desirable in the prosecution of the art of farming they will yet be probably better known by young men of 18 years of age who have been brought up on farms than to any professor whose services can be procured in an agricultural college, and yet I understand the scheme embraces this kind of instruction at least to a limited degree by requiring from two to four hours manual labor per day from each of the students. However desirable the kind of teaching may be, few I think would believe that it is necessary to establish an independent college to impart this kind of practical knowledge. A few lectures or a few hours instruction in each branch of farming would undoubtedly exhaust the knowledge of the professor and fill the capacity of the student to the utmost. But I believe that training in the manual processes of farming is regarded by the advocates of the new plan as of minor importance, and that the great desideratum is to have the theoretical and scientific principles of agriculture taught,

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and here the interesting inquiry arises as to what they are and how a knowledge of them is to be imparted.

I have been greatly interested lately in reading a very able report made by Col. Vilas and Mr. Hitt, a committee appointed by the Board of Regents of the State University, who have evidently investigated this subject and whose views have been made public through the press. While they do not think an institution separate from the University is desirable or wise, they have enumerated the branches of knowledge which they think should be taught in an agricultural college. They are first, agriculture, embracing lectures on stock breeding, dairying, crops and rotation, drainage, general farm management, and farm bookkeeping they add, and other kindred subjects, but are evidently at a loss to name them.

Now their first subject, stock breeding, is in an uncertain and unsettled condition; a subject on which the most intelligent farmers differ and which seems to depend upon natural judgment of each individual for success. Nobody can tell whether "in-breeding" is wise or foolish, whether line breeding ought to be pursued or animals selected for their individual merits, what breeds are best for the farmer, and when it comes to judging of stock at exhibitions, nobody seems to be able to tell what animals ought to receive prizes. In respect to dairying, I suppose that any of our best farmers engaged in cheese or butter making, or for that matter an English dairy maid from the districts in England in which Cheddar and Stilton cheeses, or the sweet cream butter of Devon are made, would impart more useful information than any professor that could be employed; and in regard to feeding dairy cows, farmers in this country are obliged to feed such fodder and grain as they can most successfully raise on their farms. Doubtless it would be interesting to them to know just how much protein and how much carbhydrates each cow consumes, but it is doubtful if such knowledge would enhance their profits.

Crops and rotation is another problem which is difficult to solve, although the benefits of rotation have long since been wrought out by the experiments of all good farmers.

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In regard to drainage it is now being urged that where it is extensively practiced it causes disastrous floods in all the streams in time of heavy rains, and destructive droughts during the dryer portions of the summer. In regard to general farm management any good farmer can give some general idea of it, but each farm has necessarily to be managed according to kind and quality of soil and the configuration of surface; and as to book-keeping, a commercial college is, I suppose, the proper place to learn that.

I have gone through this test of what is designated as agricultural knowledge for the purpose of inquiring where a professor competent to teach this uncertain and unsettled branch of knowledge can be found. As to the other branches, botany, chemistry and veterinary surgery and medicine, they are all established sciences only incidentally connected with agriculture and wholly inapplicable to the practical operations of farmers.

Within a comparatively modern period great expectations were awakened by the application of chemical analysis to agriculture, and it was fondly hoped by many that farming could be brought within the field of science, that by analysis of soil and crops, and especially by the manufacture of artificial fertilizers, the great problem of the uniformly profitable cultivation of the soil was to be solved, but every intelligent reader of agricultural literature well knows how such hopes have been utterly disappointed. No intelligent and honest teacher will now even advise any farmer to use on any crop any one of the multitude of artificial fertilizers with the expectation of deriving a profit from the use. The advice of all honest men in such cases is try a little and if it proves successful, then cautiously increase the use. No one now pretends to know what the result will be on a given crop on any soil.

Notwithstanding what I have said of the course of instruction recommended in this report which may be regarded by some as criticism, I believe it to be the most practical and useful course that can be named, but it shows the poverty of resources which exist for the purpose of teaching what is by courtesy called agricultural science.

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The truth is that when men begin to theorize in regard to the practical methods of farming, however wise and experienced they may be, their utterances not only become worthless but they are worse. They mislead farmers to their injury and loss nine times out of ten. But do not misunderstand me. I am not opposed to the expenditure of money for the purpose of conducting experiments with the object of eliciting facts which may aid agricultural industry, but I believe that those experiments are now carried as far as is either useful or profitable. The chemical analysis of foods, experiments in feeding, the investigation of the structure and modes of growth of vegetation if persisted in long enough may result in some knowledge that may be of practical value to farmers. At all events they add to the store of interesting scientific knowledge.

In regard to the land I believe there is now more of al kinds contained in the University farm than has been or can be put to any profitable use. If no profitable use can be made of a moderate sized farm what right have we to expect that such use will be made of a large one.

The truth is that the value of learning derived from the teaching of schools is greatly overestimated except in the purely scientific branches of knowledge; the kind of knowledge contained in the text books of schools is of the most useless kind in the practical affairs of life. The main claim made for the study to which the youth of the country are required to apply their time in schools, is that it disciplines and strengthens the mind. In my judgment it would be far better to discipline and strengthen the mind in acquiring the knowledge useful in actual pursuits of life in which young men intend to engage when they strike out for themselves. This evidently would not permit all, however various their future avocations are to be, to apply many years of their life in pursuing the same formulas of study, learning the same things, without regard to their future pursuits in life.

Schools make scholars, but experience in business affairs brings wisdom which makes men successful in every station in life, from the day laborer to the highest field of

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statesmanship in managing the affairs of a nation. When Abraham Lincoln had reached the age at which scholars generally graduate from highest universities, he could barely read, write, and cipher as far as the rule of three. Who will claim that he would have been a stronger or abler pilot to guide the nation through the terrible storm of rebellion which shook our government from foundation to ridge tree if his earlier life had been passed in colleges and universities instead of gaining a knowledge of men and experience in the rough and unlettered surroundings which developed the strong man and the great statesman fitted to guide a great nation in its times of danger.

As Tennyson said, in view of his extensive acquaintance with "Simon Wrongless" and "double fists," men who had taken the highest honors in the English universities, "knowledge comes but wisdom lingers" from a training in colleges and universities.

It is probable that the mixed system proposed of part study and part manual labor is the worst that could possibly be devised. There is to be enough manual labor to interrupt study, but so little as to prevent the formation of, or destroy if already formed, the habits of steady continuous labor necessary to success in any industrial calling.

In my judgment we had better make haste very slowly in embarking in the enterprise of an extensive and costly school for the teaching of agriculture.

SCIENCE IN AGRICULTURE.

BY C. R. BEACH, Whitewater, Wis.

Mr. President, Ladies and Gentlemen: I am here by the invitation of your secretary, and my subject is, "Science in Agriculture, and how the farmers of Wisconsin can best secure its benefits." Were slang phrases allowable before this dignified assembly, I should probably say that I was well aware that I had bitten off more than I can chew, but if you will pardon my egotism for a few moments I will tell you how I came to do it.

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Some time ago, while taking dinner at the Park Hotel, in this city, I observed a man across the table gazing at me with a look of reverential awe, akin to that with which a Hindoo is supposed to regard his idol. I thought the man slightly insane. At length he spoke.

"Do I have the honor of addressing I. C. Sloan?"

I answered, "No." The spell was broken. The look of worshipful reverence faded out from the man's face, but the vanity and self-conceit engendered in me by that man's mistake has grown into a foolhardy desire to emulate in some way my distinguished prototype, and so I have chosen this subject as affording an opportunity of presenting a few thoughts suggested by those he gave to you at your last annual meeting, under the head of "Management of the University Farm and Experimental Station," in which he claims that the institution which, out of courtesy, is called the agricultural college of Wisconsin, supposedly designed to aid or perfect the agricultural education of farmers' sons, and such other persons who, from taste, inclination or interest, may be inclined to make farming the occupation of their lives, is a failure, or if not entirely so, that the benefits have been extremely meagre when compared with their cost. A conclusion I shall not attempt to disprove.

In giving the reasons for this apparent failure, he tells you that it is because there is nothing to teach; that there is no such thing as science in agriculture; that the task of making brick without straw, which the Egyptians imposed upon the Israelites, was light compared with that which has been laid upon the regents of the university, and the professors having in charge the farm and experimental station, for the purpose of teaching the science of agriculture, something which has no existence in fact.

That in farming, we have no established demonstratable general principles which are reduceable to practice. That in all the accumulated stores of knowledge pertaining to agriculture, there is nothing that could be properly dignified with the name of science.

That the good sense and experience of the farmer is his only safe guide and even that is a very uncertain guide.

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That the solution of the problems that constantly presented themselves to the farmer, several to depend upon instinct quite as much as upon reason (with a preponderance I suppose in favor of the instinct). When I read this and much more of similar import, I could not help admitting that although the paper seemed open to criticism, as being opposed to the general received opinion of mankind, and also at variance with the deductions of sound logic, it could certainly lay claims to profound originality.

But after reaching such conclusion I came across a speech made by another learned doctor of the law, which led me to change my mind and to exclaim with Solomon, *that after all there is nothing new under the sun.*

The speech to which I refer was made some three thousand years ago, somewhere in the Persian empire, and the occasion so far as I could learn from the record (which I admit was somewhat obscure) was a meeting similar to this in which the higher education of farmers, was being discussed.

After some preliminary discussion, a learned Rabbi or doctor of the law, whose wisdom was known throughout all Asia, arose and said:

"How can they get wisdom who hold the plow, and that handle the good, that drive oxen and are occupied with their labor. They give the mind to make furrows and their talk is of bullocks, and they are diligent to give the cows fodder. But they shall not be sought for in public council; (never a mother's son of them shall even go to congress); nor shall they sit high in the congregation. They *shall* not sit in the *judges seat,* nor understand the sentence of judgment. They *cannot* declare judgment and justice, and they shall not be found where parables are spoken. But they will raise crops, breed *children,* and pay *taxes* and so maintain the state of the world, but they should have no higher ambition than to work with *their hands* sixteen hours a day on their *farms.*"

To you who believe in the tendency of professional education and training to cause men to entertain similar ideas and modes of thought, though separated by long periods of

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time and thousands of miles of space, will find in this coincidence a conformation of your theory.

But I who believe in the transmutation of souls, imagine the possibility of our distinguished lawyer, farmer and university law professor and that old Persian Rabbi, being identically one and the same individual.

But to my subject!

"Science is the philosophy of facts. It answers to the question 'Why?'" Its province is to explain why things are, as they are. It deals with causes, first principles, law.

We find ourselves surrounded on every side by an endless variety of objects, and unceasing activities, the forms in which matter presents itself are infinite, yet behind' within and around each individual object are forces at work impelling it to assume new forms and still greater varieties; nothing is permanent, nothing is at rest.

To determine what these forces in nature are, to explain how they act and the changes they produce, and at the same time to show how they may be made to supply the wants, to lessen labor, and to add to the comfort or the happiness of man, is the field that physical science claims for itself. This field is as wide as the universe, and as boundless as immensity.

It reaches out on the one hand as though it would grasp the *infinite*, and on the other it busies itself with particles and atoms, and molecules of matter so small that even the imagination cannot conceive of their littleness.

The first, and perhaps the most important truth, that science has revealed, is that the laws that govern matter act with *unvarying* precision and *mathematical exactness*.

Were I to drop a ball from any given height, knowing the law of gravitation, I could tell without mistake the time it would occupy in falling, the momentum it would acquire and the force it would exert when it struck the ground. I might drop the same ball from a hundred different heights, with a hundred different results, yet each result could be predicted with precision and exactness.

By the application of the same law we may determine

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with such absolute exactness as to the force that a stream of water falling upon a wheel will exert, that the trial test will in no way differ from the estimate.

In a set of weighing scales, each lever and fulcrum, and weighing bar and balance weight, must be made in accordance with a known law of mechanics, in order that the scales may weigh right.

What the scales are to things having weight, science is to our theories and our practice. The design of both is to do away with guessing and to determine with certainty whatever is within its sphere.

The locomotive that drew us here to-day, was not a chance combination of probabilities, or fortunate guesses. The maker of that engine knew as well before he lifted a tool to build it, as he knows to-day, what it would be able to do. The amount of fuel it would take to generate a given amount of steam, the force that steam would exert, and the safety point of the boiler under pressure, for the reason that each part was made and placed in position in accordance with *law* worked out and formulated by science.

Science, then, in any field it has mastered, sets up standards by which we may test our theories, and determine beforehand, with certainty as to what will be the character of our unaccomplished results.

Having learned the *law*, and work in conformity to it, the result will never disappoint us.

If this be true, scientific knowledge, that can be reduced to practice, must possess *great value*.

The ancients knew comparatively little of what we moderns call science. Indeed it is less than two hundred years since any correct ideas of the simple elements of matter were entertained or any philosophical method of investigation adopted.

During the last century many important discoveries were made, and principles established; but it is within this nineteenth century that its chief *miracles* have been *wrought*. The contributions that science has made to the world's wealth, and the world's comfort, have followed each other so rapidly and have been so soon incorporated into our daily life that

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we forget that they have not always *been*, and fail to give credit to the courses from whence they come. The memories of living men go back to the time when steam power became an established reality, but during that short time it well nigh revolutionized labor, changed our methods of living, and I might also add our methods of thought.

Since *then*, the *general* use of *steel*, the *telegraph*, the *telephone*, the *lucifer match*, *gas light*, and *electric light*, *artificial cold* and the *art* of *canning*, are only sample specimens of the contributions that science has made to the world's betterment.

Were we placed back only to the time of our grandfathers, we should begin to feel that the world was a dull place to live in.

Whether we shall ever so control and apply the forces in nature, so that we may entirely dispense with physical labor, is a question that the future must answer.

But only a few days ago, the president of the United States, standing in an inner chamber of the White House, in Washington, touched a key that set in motion the machinery of the New Orleans Exposition. Believing that, I am ready to accept the wildest dreams of your imagination as among the possibilities.

But what has all this to do with science in agriculture? Indirectly much; society is a unit, and all its parts are so united, that what benefits a part benefits the whole. But in the rapid race of progress, agriculture has not been the slowest dog in the pack, running far in the rear, and whose occasional howl only indicated how far behind it really was, but it has kept equal pace with her sister industries in her appreciation and *adoption* of whatever science has demonstrated to be of value, and I am not sure that in this very particular farmers are entitled to the very first rank, not that they have as a class, shown much skill in applying science to mechanical inventions for their own benefit.

In this direction a few soft-handed brain workers, have accomplished more than the whole body combined.

Yet the keen *appreciation* and the *readiness* that the farmers have shown in adopting whatever was useful, has been

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the real cause in bringing our agricultural machinery to its present perfection, and were the farmers of Wisconsin deprived of all the mechanical appliances, to which science has in any way contributed, I do not think there would be any danger of *glutting* the *food* markets of the *world.*

I think we may safely say that to-day half the world's productive work, and three-fourths of its comfort are the direct contribution of applied science.

But while acknowledging and fully appreciating this *left handed* aid that science is giving to agriculture, we have a right to ask: Is there any scientific knowledge that can be imparted to the farmer, by the use of which he can produce better results on the farm than he could without it?

I unhesitatingly answer *yes.*

"That the direct" application of science on the farm has been less marked than that of the aid given through labor saving machinery may be accounted for by the fact that the high price of labor has offered a greater stimulant in that direction. And the new and improved implements have led to better cultivation and so to better crops without the direct aid of science. And the rapid extension of railroads into new and fertile countries, opening up new fields for cultivation, and new ranges for cattle, has caused production to outstrip demand. These two causes combined may have somewhat retarded the direct application of science on the farm, for we all know that we are not apt to seek outside aid unless driven to it by our necessities. And there science offers its aid under different conditions to the farmer than to the mechanic. A steam engine could never have been built but for the discovery of the laws that govern steam; whereas grain would be produced and cattle raised without a definite knowledge of the laws that govern their growth. But if the laws that underlie plant life and vegetable growth and animal growth are as fixed and inflexible as the law of gravitation, and who doubts it, we shall certainly succeed best where more in harmony with them. I am ready to admit that in many things farmers do, to some extent, work in harmony with the laws that underlie their operations without knowing what those laws are. But does any one doubt

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that they would have succeeded better had they known them? One thing is certain, we always fail when we act in opposition to them, and these failures might be less frequent were our knowledge more scientific.

Some time ago, when visiting the university farm, Prof. Henry showed me two pigs that he was feeding a mixture of skim milk and Indian meal, in proportions laid down by German scientists, in which it was claimed there would be no loss of nutritive qualities of either milk or meal, but that both would be thoroughly assimilated. He named the proportions in pounds. Said I, "that is a bushel of meal to a barrel of milk." *Any fool knows that mixture will fatten a pig.* But I did not know that those were the proportions that would *best* fatten him.

And so with much of our best work on the farm while it produces good results, we lack the assurance that they are the best results, for the want of that exact knowledge that science alone can give. And in these times of much work and little profit, the doing about right, or *exactly* right, will probably mark the line between losing and making.

Science in its direct contributions to agriculture has determined the simple elements in matter; taught us of what the different soils are composed; has analyzed all our grain and grass crops; shown how their elements are combined, and the sources from which they are obtained, which from the atmosphere and which from the soil. The influence of the *germ* of *heat,* and of moisture upon vegetable growth. How the soil becomes exhausted, and how its fertility may be best preserved, and how restored. At what period in their growth our field crops contain most nourishment as food. Upon these and other points it offers us knowledge that is positive and definite, much of which is of great practical value, and all of it a sources of intellectual pleasure, and intelligence lightens labor. Much of our richest lands are unfit for the profitable growth of grain or grass without draining. But draining involves so many scientific principles that it might almost be said to be a science of itself.

The state of Wisconsin has over five million acres of

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marsh land, and as much more that would be greatly benefited by draining. Were these ten millions of acres thoroughly drained, the added wealth that would accrue to the state would not be less than *one hundred million dollars.*

But the farmer's chief profit lies in converting the more bulky products of his farm into beef, butter, cheese, pork and wool. In aiding him to do this with the greatest economy, science has determined the nutritive properties of our various feeding crops; shown what is their *actual* and *relative* value for feeding; shown how the *muscle forming* and the *heat and fat producing,* should be combined. The ratio they should sustain to each other to produce *specific results, without waste.* Upon these questions the most intelligent farmers are having more and more faith in the teaching of science, and they attach great value to them as giving knowledge that could never have been obtained by experience alone. But however scientifically we may feed for a specific purpose, the best results can be obtained only by feeding to animals designedly bred for that purpose. But breeding for a specific purpose is a *science,* a knowledge of which never comes to us by *instinct* or *intuition.* It may be taught, but it *must* be learned before it can be successfully practiced.

Upon these two points, scientific *feeding* and scientific *breeding,* the farmers of Wisconsin need line upon line and precept upon precept. The value of our feeding crops amounts to not less than $40,000,000 annually. That is what they are worth in the fall, but what have they to show in the spring; maybe half that amount, but I fear not, and all on account of our slovenish, hap-hazard, no system method of feeding. Should we but half follow the light that science gives us we should add our wealth by millions yearly. Some of us farmers might get rich enough in time to go to Congress. Said an American traveler writing from Europe: "Chief among the causes that have contributed to German supremacy we may name her *science* and *system* in agriculture." What *science* and *system* has done for Germany it can do for Wisconsin. Mr. President, there is such a thing as science in agriculture. The farmers of Wisconsin believe

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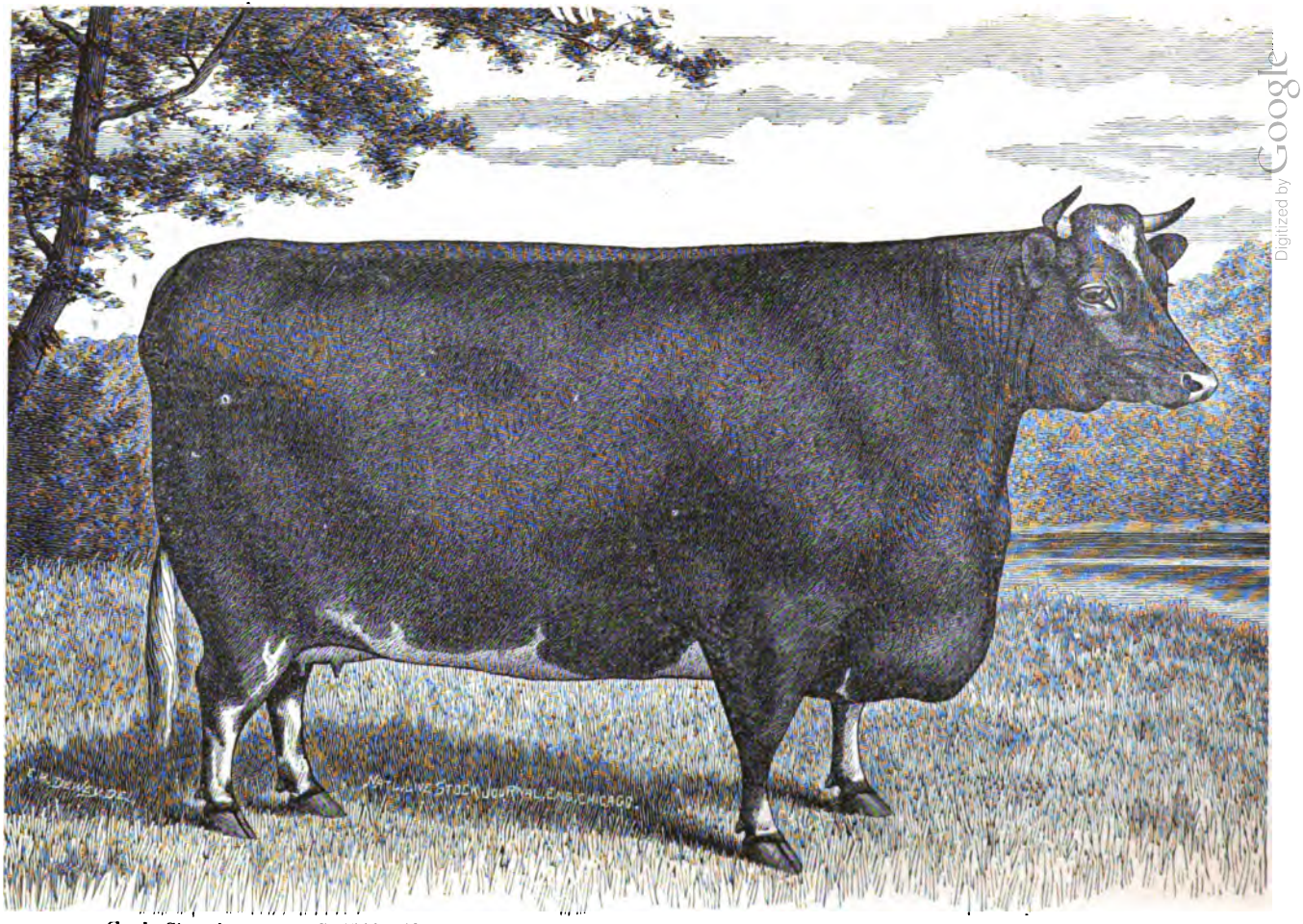

Grade Short-horn Cow, CANADA'S PRIDE. Property of CANADA WEST FARM STOCK ASSOCIATION, Brantford, Ont.

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in it, and are desirous of securing its benefits. But science is not a self-moving, self-applying force and the question is, how its teaching shall be best incorporated into our various systems of farming so as to produce the best results. The public press, papers and discussions at conventions of special industries, and public exhibitions are doing much to awaken public interest in agriculture and to increase the general stock of knowledge. But the knowledge thus disseminated is fragmentary, it is not critical, it forms no part of a system. It is not scientific. Among a large class of the most intelligent farmers of this state there has been for some time a growing conviction that this want could be best supplied by a school purely agricultural, whose sole object should be to educate farmers in their business. Not a school for training scientists, not an experimental station, for determining new principles, or of discovering new methods of applying old ones, but a school where scientific knowledge of practical value should be taught in connection with its direct application.

Science in draining, in manuring, in feeding and in decaying, so applied that it can be clearly demonstrated that such application has resulted in an increased production and in an increased pecuniary benefit in proportion to money and labor expended.

Recently these convictions have taken definite form and steps have been taken looking to the establishment of such a school.

A plan has been outlined and a bill has been introduced into the legislature asking for an appropriation to carry it out.

I think the movement well timed and that it meets the almost universal approval of the farmers of this state.

And if this appropriation is not made at this session they will be disappointed, they will feel that they have not been well used, and that their wishes are not properly regarded.

If it is to be done at all I see no good reason for putting it off. Science hall will have to be rebuilt of course, but the building of one school house ought not to bankrupt a state with a $1,000,000,000 of taxable property. Two years from

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now we *may* have *two* to build, and if *this* school is for the public benefit the sooner we have it the better, and while I most heartily indorse the movement, I wish to offer a few suggestions upon that part of the plan which contemplates the severing and virtually abolishing the agricultural department of the State University, by appropriating the endowment fund to the support of the school proposed.

We are all ready to admit that the agricultural department has been a failure, and it would be useless at this late day to show the reasons why.

Perhaps when established it anticipated a want not then felt. It may be that the faculty of the university has at times turned to it, a cold shoulder. We know that the farmers of Wisconsin have. They have not visited it; they have not been ready to speak a good word for it. They have not sent their sons to it, and they have become so used to flinging dirt that they have not always been willing to give it credit for the good it has done.

But recently it has shown more signs of life, nine or ten students are attending its course. The work at the experimental station is of acknowledged value.

Who is able to say, that it has not entered upon the dawn of a better day, and that with changed conditions in its favor, it may not in time rank equal with the other departments.

Should the school contemplated be as popular with the farmers as its friends have a right to expect, one will hardly supply the wants of the 120,000 farmers of the state, but a half dozen will soon be needed. Should but one boy from each twenty farmers seek admission there would be 6,000 pupils. Enough for ten schools of 600 scholars each.

And you will want managers, professors and teachers, and where can this want be so well supplied as by the agricultural department of the state university?

Hitherto the sons of farmers who have attended the state university have not entered the agriculture department for the good reason, that their education comprised not only their whole stock in hand but also their patrimony. The boy that stayed at home had the farm. The university boy

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after having received his education was expected to make his own way in the world, and we all know that the professions, or teaching, or engineering offered surer pecuniary returns than they could hope to attain through the agricultural department.

But establish this kind of school, establish experimental stations and all will be changed. The hope of obtaining positions in them, will inspire the farmer sons with a laudable ambition to fill them, and the surest road will be through the agricultural department, and so the university and the schools will act upon each other, upon the principle of crop fertilization, to the benefit of *both*.

We are asking that the commissioner of agriculture be made a cabinet office on account of the importance and dignity of our calling.

Ought not the same motive influence us to retain our hold upon the university? Are we ready to admit that our business is so menial that no farmer's son should ever aspire to its benefits?

Would it not be better to sustain it and reap its benefits? The $10,000 that might be needed annually to run it would amount to less than ten cents a year for each farmer in the state. *The price of a cigar.* It ought to be worth that for a *figure-head* if nothing more.

I have known several instances where men, in building new houses have, in order to save expense, taken down old ones to obtain building material; and the conclusion in every case has been: *better have let the old house stood.*

But whatever may be done with the agricultural department of the state university, let us by all means have the new school after the plan proposed. The farmers of the state desire it. They believe that it will promote their interest.

And in carrying any plan that has for its object the advancement of agriculture, the state can well afford, and is in duty bound, to give liberal encouragement and substantial *aid.*

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Superintendent Graham of Public Instruction was called upon to give his ideas on the proposition to have districts pay for school books.

Supt. Graham.—The matter of free text books has been placed before you by your president. I am in favor of it for three reasons. 1st. That it will promote a greater attendance of the pupils in our state; 2nd. That it will give greater efficiency to the school work, increasing it in the country districts probably one quarter; and, 3d. Its economy to any given locality. These are so patent that they do not need further discussion, that is, they seem so to me. There may be some obstacles in regard to the matter of detail, in order to get a bill which shall pass the legislature, perhaps during the coming days, but it seems to me that those obstacles may be overcome. At least one state in the Union is trying this, and only one to my knowledge, and that is the state of Massachusetts. I received a letter from the secretary of the state board of Massachusetts, some days since, in reply to a request of mine that he should give his opinion on that subject, and he said that, so far as they had had an opportunity for experiment, it was doing good service, and I most heartily indorse the suggestion made last evening in the president's address in this direction.

President Arnold—I will take the liberty to call your attention to another item in my address. That was that I recommended that we have our teachers as soon as we could get a book, and I think they have one in use in Canada on "First Principles of the Science of Agriculture," that each teacher shall pass an examination and shall have a grade standing according to his examination in that particular branch, and that this shall be taught as other branches are taught in our common schools. This would be certainly a move in the right direction. This is not obligatory in Canada, but the officers in charge of it have recommended it to be the case in Canada. It is something perhaps that has not been thought of very much, but while we are discussing this question of having an agricultural college, why not have it in the common schools, and why not make the common schools as good as possible, and if so, make them practical

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and for the benefit of farmers, where most of the farmers sons are in attendance. Also free books. Books now are bought of the bookseller. They cost about twice what they should. The poor man who moves from one district to another is constantly compelled to buy books for his children. The consequence is that a large number of them are absent from school, about one fourth of them are out of school. If books were paid for by the district they would cost no more to the tax payer than now, because they would be bought in large quantity, and the books would be uniform, and no change would be necessary. I think these are questions which the farmers should consider.

Mr. Hinton — I would like to say that there is a gentleman living in Milwaukee known to a great many of you who gave a standing order to the superintendent of schools there, that whenever to any of the teachers there came the knowledge that the parents of any child were too poor to furnish books, to direct the furnishing of the books and to send the bill to him. It has always been done.

That is confirmatory of your views. That gentleman is Alex. Mitchell.

Mr. Hoxie — It seems to me that that does not conform to your views. There are hundreds and thousands of families too poor to buy books for their children, but they do not want it published to the world that they are. I think that your suggestion was that we have free books, whether I am able to buy books for my children, or whether my neighbor is unable to buy his or not; that those books are to be free for all the children. That is what I understand the principle to be. I do not wish any child in our broad domain to be a beggar, and if he goes to the school with a certificate that they are not able to furnish the books that debases that child; he has lost his manhood.

Mr. Hinton — I believe that, in my long residence in this state, that fact has never before been made public. Mr. Mitchell is one of those men who, like the Quaker, does good by stealth and blushes to find it fame.

Mr. Austin, of Neillsville.—Is not it a fact that a great drawback in agricultural education is the lack of text books

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on that subject? Are there any text books printed on that subject and is not it as well for us while we are considering this thing to start at the foundation and inaugurate some movement by which the vast amount of agricultural literature, which at present is lying mouldering upon the shelves, in magazines and agricultural papers, lectures and papers written at these agricultural meetings, be got together and systematized, and from that some text books made that can be used, not only in common schools but in this agricultural school that we are talking about, that teachers may have something to go by? I do not take it for granted that we are going to employ actual agriculturists off from the farm to teach the school after we get our buildings built. We have got to take from the colleges those who are competent to teach, whose business it is to teach, and they can teach from text books only. Of course we can have some professors of agriculture, whose business it is to know agriculture from top to bottom, but that cannot be the case with all those professors or teachers in those schools, and. while I am talking about it, although the resolution has passed this evening, saying that we want an agricultural college, I want to say, as a farmer from the north end of the State where agriculture is yet in its infancy, where we yet see the need more of agricultural education and knowledge than you do in the southern part of the state, where you have had years and years of experience — we are just passing from the lumbering state into agriculture—our idea up there is this, that the present step from the common district school to the university is too long for any of our boys or girls to take. We want an intermediate point. We want an agricultural school or college, so that the boy or girl of ordinary intelligence from the common district schools of our state, can, with their district school knowledge, be qualified to enter that agricultural school. It wants to be an intermediate step between the district school, or our common high school, and the state university. There are none of the average farmers in the northern part of the state, and I do not think that there are in the south, able to educate and fit their children to enter the state uni-

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versity. There are no intermediate schools within their reach. They have got to send them away from the district school to some academy of learning, less than the state university, and pass through some intermediate school before they can reach the state university. I apprehend this is one of the great difficulties in the way of the success of the agricultural part of the state university. I do not believe that the agriculturists are looked down upon by those who are taking the literary course. I do not believe there is any set of men, young or old, in the state of Wisconsin that think more of themselves, that have more respect for themselves, and command their position in society better than the intelligent agriculturists of the state, and I hope that, while this thing is being considered by our legislators, that they will take into consideration the wants of the farmer. We do not have language to tell them what we want. We are not competent to draw the bills, but we can give them the ideas, and let them crystallize the thought and put it in shape. That is their business; that is what we elect them for, and what we pay them for. What we want is an agricultural school, where every boy and girl that passes from the district school can enter without any further examination than they can be able to pass after leaving the common district school of our country.

Mr. Buell, of Madison — In reference to text books, I will state that that question was presented to the committee on education the other day by the gentleman from Eau Claire, Mr. Williams, and I think Mr. Williams can perhaps give you as many points upon this subject as anyone, and he is a gentleman who has had large experience in teaching, and has had a chance to observe the practical workings of the system.

Mr. Williams, of Eau Claire — I have not anything to say on this question except that my experience agrees exactly with what one's reason would teach him in regard to this matter, and that was referred to by Superintendent Graham. The matter of economy of course would justify it. On all our book shelves there are many books that are all the way from new to half worn out, owing to changes, removals, or

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some other cause. With the free text book system, all the books are used until they are not fit for use longer. The attendance at the school in the village of Eau Claire I think has increased about 10 per cent., and the regularity of attendance is better, and we get in a different class of pupils than we otherwise would. There is nothing in it that I know by experience that any one cannot sit down and figure for himself. Certainly no one who is in favor of it will be disappointed in the result, only I would say this that the expense of supplying a school with books is not near so large as one would suppose. The books do not wear out so rapidly as one would suppose. Our experience was that the expense was not half what we supposed it would be on the first introduction of the books, and in maintaining them afterward. I have not the exact figures now, but it was a very small sum of money for the number of scholars we had, about five hundred, enrolled in the school during the year. As the law now stands, it leaves it with the district to furnish the books if they choose. I think the law now is that the district furnishes the books. The matter has just commenced to be argued and discussed in the legislature, and what form it will take finally I cannot foresee. I think that the bill as now drawn provides for the districts furnishing the books.

Mr. Hoard.—In case such a law as this that has been spoken of this evening does pass this legislature, if the buying of the books is left to the several districts of the state, injustice often will be worked to the young. I know of districts in the state that handle their schools as they do their roads, operating with as little expense as possible, even to the building of school houses and the hiring of teachers, and I think their parsimony and narrowness of judgment in regard to the real interest of their children would apply in the purchase of school books the same as anything else, it is very hard for any government to be paternal sufficiently that the best judgment of all the people should be applied to all of them, but it is a fact, and I know of it in my own town, where parochial schools are attended by one hundred and fifty scholars, and the district school by fifteen. Now it

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seems to me that in case the text-books are left to the district that there would enure some damage to the scholars in the same way. Speaking about their handling them as they do their roads, the average roads of Wisconsin ought to be a question before this agricultural convention. An old Irishman said to me once in the state of New York, "If there are forty or fifty men working on the road, and there is five or six sated by the side of the road discussing the politics of the country, and looking after the general interests of them all, begorra I am one of the five or six." (Laughter.)

Mr. Chandler — I want to say one word on two or three points that have been made here within the last few moments, and I will begin with the last point made by my friend Mr. Hoard. The objection that he raises to leaving this matter with the school district board applies with equal, if not greater, force to leaving the management of the school at all in such hands, and yet during all the history of the state of Wisconsin we have left the management of these schools to these district boards, with a very fair and reasonable degree of success, as he will admit; not altogether successful, but in the main very fairly successful. Now I want to state one little point of experience about this matter of cost. There is a history upon this matter in this state that should be widely known in connection with this very matter. As you all know, we have four normal schools in this state. In each of them there are gathered from 400 to 500 students and have been since their organization. It has been the policy of the management of that school from the beginning to issue free text-books, not absolutely so, but nominally free to the students attending those schools. The management buy all the school books that are used in those institutions, and rent them to the pupils at a dollar a quarter, $3 a year. Now for the result. This experiment has been going on for ten or fifteen years in this state, and the result has been that an income of $3 a year from each student has paid for every text-book that has been purchased and used in the schools all these years, and has in addition thereto, provided a very valuable reference and miscellaneous library,

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consisting of from 1,200 to 1,500 volumes in each school, and a balance left over in the treasury to the credit of that fund.

The point I make is this; that it has cost these students attending these normal schools, where they are required not to use the ordinary and cheaper grade of books but the upper and better grade of books, only $3 a year per pupil, and I will ask the farmers of this state if they can say that it has cost them but $3 per child for text books during as many years. I believe it is a matter of the greatest economy to have such a measure passed, and it seems to me that the district board, the unit upon which we base and from which we manage all of our school matters, is the proper unit. The board to have the initiatory control of this matter of the purchase and care of the text books. We want as little machinery about is as possible. We do not want to do as they have to in Minnesota — make a requisition on the county superintendent, and the county superintendent on somebody else, and then from that source the books are to be distributed at great cost and liability to loss and damage. One thing further that has not been urged. My friend across the hall has spoken about the want of uniformity of text books, and we know that in a great many quarters this is considered a very great evil. I never have sympathized with that sentiment very much myself, because I believe that a teacher who can teach the multiplication table and teach it well, can teach it whether the pupil has a *Robinson* or a *Davies*, or any other kind of an arithmetic, and so I believe that we ought to work for a grade of teachers who can teach topically, who can make use of the tools which are in the hands of the children, and if they happen to have a *Monteiths' Geography* can teach that the earth is round, or if they happen to have *Harpers' Geography* can teach that the earth is round and moves, or if they happen to have *Swintons' Geography* can teach that the earth is round and that it moves around the sun.

I do not believe that there is any great difficulty with the diversity of text-books if you have the right kind of teachers, but if we desire to bring about uniformity, there is no quicker, no surer, no more economical way of effecting that

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result than by this proposition that is now before the legislature to require the district boards to furnish all the books that are required in that district by the pupils. I want to second most heartily the remarks of the gentleman who made the suggestion with reference to the lack of intermediate schools for the benefit of those who reside in rural neighborhoods. I do not think that I ever heard a more pertinent or truer remark made during this convention than that, and I believe that it strikes the center of this whole difficulty, and it has been a thing upon which prominent educators have concentrated their thoughts and their actions for many years. It is known to very many within the sound of my voice that for many years the leading teachers and prominent men connected with the educational interests of this state have been so directing their efforts that the common school system may have some point and direction; that it should not be left to haphazard in all its phases; that it should be so hemmed in, if you please, so guided by courses of study, by objective points to be reached by the pupil, by systematic and progressive work in all its parts, that there should be a direction given the pupils' minds, and to pupils' ambitions and pupils' ability to step from these common schools into higher institutions of learning. And we know too well that in all these efforts that have been made, we have been met with just this difficulty. We cannot teach Latin and Greek and the higher mathematics and the sciences to any great extent in our common schools, and yet, right on the threshold of this endeavor we have been faced with this fact, that to enter the colleges of the state, to enter the University of Wisconsin, and enjoy the advantages of their courses of study, these pupils, with good, reasonable English education, could not enter there without preparatory training in the languages and in the sciences and in the higher mathematics.

We have not been so fortunate in this state, if fortunate I may term it, as the eastern states which are dotted all over with these intermediate schools, with academies and preparatory schools of every grade right at their doors, without the necessity of sending children away from home at a sac-

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rifice that very few, comparatively, in the rural districts are able to meet. This idea of intermediate schools has been also brought out very clearly by the paper which was read here to-night by Mr. Beach, and he has given you warning, and it pleases me exceedingly to hear him say it, that if you enter upon this work, if you do what Mr. Hoard told you last night you ought to do, stir the intellectual activities of the rural population in this state from center to circumference, so animate it with ambition and with force that it shall be an irrepressible power in every community. Mr. Beach has given you notice that not one agricultural college will answer at all for any length of time. Ten of them, twenty of them, perhaps; the more we have of them the better, but this we do need, we are conscious of this to-day, these intermediate schools, from which the ordinary child that has not perhaps a classical education or an education that will fit him for the practice of the professions in life, shall have advantages which will give him extended culture and with that culture extended power. Last spring, Prof. Henry of the state university, had a course of study for the agricultural department of the university, and I scanned their circular with a great deal of interest. I discovered that if that course of study was carried out, and the proposition therein made was enforced, that it was possible for the graduates of a good, common school to enter the state university in this agricultural course, and to take up a line of study that should be in his direct interest to pursue as a farmer, and also at the same time have open before him other courses of study which would enable him to gather self-instruction and self-culture in other branches of study if he might desire it. I believe that that was a wise measure, but I understand that by some arrangement or by some rule it has been determined that that is impracticable, that this preparatory study must be had before pupils can enter the other classes of the university, and that it is insisted that that is a necessity of the condition of the growth and of the very existence of the university itself. That may be so. The authorities that have that institution in charge are

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the persons to determine that question, and they no doubt determined it wisely, in their own estimation at least.

Mr. Hoxie—I wish to present a resolution, but before reading it I will say this, that the last congress has passed an appropriation of $50,000 to provide for experiments in the production of sugar from sorghum: It was considered impracticable for the department longer to attempt to raise sorghum to experiment on, and this appropriation was made so that the experiment might be carried out in different parts of the country. The governor of this state has urged the establishment by congress of an experimental station in the state of Wisconsin to experiment on that article for this latitude. This appropriation has not yet been expended, and the chemist of the agricultural department writes me that he will use his utmost efforts to secure a portion of the appropriation in this state, and I would ask this convention to pass this resolution:

Resolved by the Farmers' Convention, That the department of agriculture of the United States be respectfully urged to establish an experimental station in this state for experiment in the cultivation of sugar from sorghum, and that the senators and members of congress from this state be requested to further this object.

(Referred to the committee on resolutions.) I will state that, unless this appropriation is passed by congress at the present session, it will be converted back into the treasury in July.

THE INS AND OUTS OF TOBACCO CULTURE.

By F. W. COON, of Edgerton.

Mr. President, Ladies and Gentlemen — As introductory, and in justice to myself perhaps, I ought to state the subject assigned to me, "The Ins and Outs of Tobacco Culture," was not of my own choosing. The programme as first printed, contained a blank opposite this topic, and I have some how gained the impression that I was selected more to fill out this blank, rather than I should be expected to furnish you any thing original or interesting on this subject. The writer's

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experience in tobacco, beginning nearly fifteen years ago with a backaching job of weeding plant beds and in watering out tobacco plants in a dry season, upon the homestead in southern Dane county, and closing with three years of hard labor as publisher of a newspaper devoted to the interests of tobacco, leads us to confess at the opening that as between the ins and outs of tobacco culture, the "ins" have it by a very large and respectable majority. To forestall any verdict of my listeners, who may say when I have closed, that the "outs" have not been fairly treated, the writer desires further to confess judgment upon the charge that he is an enthusiast upon the subject of tobacco and has no disposition at this time to go back upon his record.

There is in my opinion no agricultural industry in our state that is attracting more wide-spread attention from the farmers of our state to-day, than that of tobacco culture. This is due partly to the seductive reports that are now being published of the profits growers are receiving for the the crop, and partly because people outside the tobacco section are learning that most of these reports are true.

Tobacco growing is by no means a new industry that has sprung up to claim this attention. Ralph Pomeroy claims the honor of raising the first crop of Wisconsin tobacco on rented land, on the prairie near Syene, Dane county, in 1854. Three years later, 1857, Chester Pomeroy grew his first tobacco crop in the state in the town of Fulton, and a crop has been grown on the same farm every year since that date. The Pomeroys having been engaged in tobacco culture in Ohio previous to their removal to this state, continued to grow the weed in Wisconsin a number of years before their neighbors became interested in the matter, and discovered that as a farm product it paid fairly good returns. It took years to establish a market in the state for this product, and to demonstrate that Wisconsin tobacco was of more than of average quality. In 1874, or just twenty years after Ralph Pomeroy made his first experiment on tobacco culture, the total acreage of the state had grown to but 1,444 acres — less than is now raised in some one of the townships of Rock county.

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The last ten years have witnessed a rapid increase in the acreage of this product, for the crop last year reached 15,836 acres, with a probable yield of over 60,000 cases. The increase over '83 was nearly 4,000 acres, and present prospects point to a still greater expansion of this industry for the year to come. Under ordinary circumstances Wisconsin will produce more tobacco in 1885 than any of the seed leaf states. In quality of leaf I might add, Wisconsin already ranks first on the list. The weekly sales of leaf tobacco in New York the past two years, indicate that the sales of Wisconsin leaf have brought higher prices than any of domestic state tobaccos, ofttimes ranging as high as forty cents per pound for wrapper stock. The sales in that market under date of January 24, will illustrate:

NEW YORK, January 24.—There were sold last week of Pennsylvania tobaccos:

Crop '81—900 cases, 7 to 10 cents. Crop '82—200 cases, 9 to 14 cents. Crop '83—500 cases, 8 to 12½ cents.

Of Wisconsin were sold:

Crop '83—150 cases, running, 27 cents (buyers took goods on installment plan). Crop '83—150 cases, all wrappers, 32 to 36 cents.

In Connecticut tobaccos the following were reported:

Crop '83—75 cases Housatonic wrappers, 35 cents. Crop '83—160 cases seconds, 11 cents. Crop '82—250 cases wrappers, 12 to 17 cents.

It may seem to you an extravagant statement, but I believe nevertheless, true, that to-day the profits in the culture of tobacco in Wisconsin are greater than any other state in the Union.

There is a limited section in the North Carolina district producing the finest quarters of the "bright" leaf where prices rule higher than here; but the yield per acre falls far below that of our own state, and the average profits much smaller. I have before me a circular of a Clarksville, Tenn., tobacco firm who quote ruling prices on a very large proportion of southern tobaccos, runing from four to twelve cents and averaging not over eight cents per pound. None of the cigar producing tobacco states have sold their '84 crop at higher prices than Wisconsin growers, while many are receiving much lower prices; while the cost of producing the crop in any of these states exceeds that of this state from

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50 to 100 per cent. To go further into details, let me here read a statement produced at a club of tobacco raisers in Chemung Valley, New York, considering the cost of raising tobacco. They were men of large experience and it was decided that several processes in the cultivation should be estimated carefully by each one, and their estimates then grouped and an average struck. Here is the result of their work:

Rent of land, including manure, per acre	$40.00
Plowing twice, harrowing and ridging, per acre	5.00
Plants, per acre	3.00
Setting plants per acre	3.00
Re-setting, per acre	1.50
Cultivating five times, per acre	3.75
Hoeing twice, per acre	7.00
Worming, per acre	9.00
Topping, per acre	.75
Suckering, per acre	4.75
Cutting and hanging, per acre	8.00
Shed room, per acre	10.00
Twine for hanging, per acre	.50
Total cost up to the time of taking down	$96.25
Cost of taking down, stripping, assorting, packing and casing, on a basis of 1,500 pounds per acre — about an average yield — at 2½ cents per pound	37.50
Total expense of raising one acre	$133.75
Cost per pound on a basis of 1,500 per acre	.089

If this estimate is worth anything, it shows that tobacco in New York state cannot be grown for less than nine cents a pound. By slack cultivation and careless handling, the tobacco grower may neglect manuring one or two seasons, and produce it cheaper, at the expense of his land.

To make a proper comparison between the east and west on tobacco raising, I desire here to introduce the reports of three successful Wisconsin tobacco farmers, and in doing so, have selected one from each of three different counties. While these reports show better averages than the majority of our farmers obtain, they are not exceptional cases, and though much more startling figures could be produced, these answer the purpose of comparison equally as well.

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1st. Mr. H. R. Hoag, of Walworth, Walworth county, makes the following report of his 1884 crop recently sold: Sixteen acres were planted and harvested, producing 24,343 lbs., which was sold at 15 cents in the bundle. The total cash receipts for the crop were $3,651.45. The cost of growing and marketing the crop, every item of expense included, was $65:20 per acre. The gross cash returns per acre were $228.15, leaving a net profit of $162.95. The cost to raise this crop was 4 and 2-10 cents per pound.

2d. Mr. Ed. Corcoran, of Dunkirk, Dane county, grew a field of 7½ acres which yielded 12,512 lbs., or 1,668 lbs. per acre. The crop brought $2,064.48, or $275.26 for each acre of the field. The price obtained was 16½ cents a pound. Mr. Corcoran enjoys the reputation of being a most careful grower, putting an unusual amount of labor and expense upon his crop. This he estimates to be $75 per acre, 4⅝ cents per pound.

3d. Mr. John A. Decker, residing near Janesville, Rock county, from 11 acres of tobacco grown by him the past season and sold at 18 cents per pound, received $2,834.28, a yield of $267.66 per acre. Estimating interest on his farm at $500 per acre, and manures purchased in Janesville at high figures, and every other expense that entered into the cost of his crop, he figures the total at $75.00 per acre. In the way of supplement we might add that Mr. Decker's farm consists of 17½ acres, including streets and buildings, and from this place during the season has received in cash $3,367.54. I am also prompted here to ask the question, How many farms do you think there are in the state controlled by one man that can show receipts equal to this report? Is there another 17-acre farm that can approach it? While the three cases above recited show cash receipts greater than the average tobacco farmer, they also show the cost of producing greater than the average. If Mr. Decker can grow tobacco on land valued at $500 per acre, purchase his manures in a high market, and show figures that places the cost below $75 per acre, I am led to believe that the average farmer whose land is valued at $50 and less per acre, and who produces

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his own manures at a nominal cost, can reduce the cost far below this figure, varying perhaps from 3 to 4 cents per pound.

It is quite generally conceded, I think, that a very large proportion of the tobacco of this state is produced at a cost not to exceed $50 per acre, and in some instances the expense is reduced to even $30 per acre. Compare this with the table first presented showing the cost in New York and other eastern states, and it can readily be seen what advantage Wisconsin tobacco growers really have over her eastern competitors.

From a recent issue of a Lancaster (Pa.) paper I clip the following, which fully substantiates the position taken on this point:

"Wisconsin has advantages over her eastern competitors that stand her in good stead. Her soil is deep and rich. Lancaster county farmers often put more money on an acre of tobacco in the shape of manure alone than it costs the average Wisconsin farmer to grow an acre. His land does not cost more than one half what ours does, and in these two items alone he has advantages we here cannot overcome. When, therefore, the frosts of spring cease early and remain away until late in the fall, the Wisconsin tobacco growers can undersell us. But other things may arise at any time to change all this and place our own growers more on an equality with the western ones."

Wisconsin tobacco growers accept the situation cheerfully nd take their chances upon any condition of things that is liable to change this inequality. I desire to present a few figures showing what the tobacco industry is doing for a small section of our state, embracing about one half of the two counties of Rock and Dane. The crop last year fell a trifle short of 16,000 acres, of which fifteen sixteenths was grown in these two counties. The product will reach about 60,000 cases, and at the average market price of 14 cents, will require two and a half million dollars to mine the crop.

The tobacco fields of Wisconsin hardly average 4 acres, a conclusion arrived at comparing lists of sales of several thousand acres, reported by the *Tobacco Reporter* the past season. There are, therefore, not far from 4,000 growers interested in producing this product, including tenants and

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sharemen. Thus it may be seen that the tobacco crop of the state will bring to each of these 4,000 growers an average of $625 a piece. Let me ask you farmers, what other product of the soil do you raise that anywhere approaches such profitable returns in cash? A satisfying feature about this business is that this crop brings cash, that it comes all at one time, and generally a large sized roll at that.

Now, let me call your attention to what the tobacco business is doing for some of the towns located in this district. I select the village of Edgerton because it is my home, and I know more of it than any of the others. Edgerton was the first shipping point and market, and is to-day the largest receiving point, as it is the geographical center of ten townships that grow two thirds of the crop. We have there thirty large packing houses which employ to-day over one thousand men, women and children in sorting and packing this product. It is estimated they will handle twenty-five of the sixty thousand cases of the present crop. The weekly pay roll amounts to over $8,000 or over $100,000 for the season. These firms distribute cash enough every Saturday night to give every resident of the village, man, woman and child, $3.00 per week. The Bank of Edgerton has paid out upwards of $30,000 per day when the receiving season is brisk. The U. S. Express Company informs us that it has brought into Edgerton since November 1st, over $215,000, to be distributed among the farmers in that immediate vicinity.

It will thus readily be seen that it is not alone the farmer that is reaping the golden harvest out of the tobacco trade.

The value of the tobacco crop of Rock county last season exceeds that of the combined values of the wheat, oats, corn, barley and potatoes, and yet nearly one half the towns are not growing this crop to any extent, and the whole acreage of the county is less than one third of a single township. Enough for statistics.

Doubtless some one in this audience will be prompted to ask this question: If tobacco growing is really as profitable as you would have us believe, if the glowing pictures you have drawn are really true ones, will not the farmers of our

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state rush into tobacco and will not the business be overdone and prices drop down to an unprofitable figure? In answer I will say that I think not immediately, for various reasons, some of which I will present.

1st. Wisconsin tobacco has an excellent reputation. Manufacturers have learned that it is the best cigar wrapping tobacco grown, and the trade consequently must buy it. It has one virtue which no other state tobacco possesses in so high a degree, viz.: It burns well — and without this quality no tobacco, however fine its flavor, is marketable. Whatever other evils it may possess it has never yet been charged that Wisconsin did not burn well. We have a reputation now gained that will sell our tobacco for years if we are careful to preserve it by improving the varieties grown and the methods of handling. [A point we seriously desire to impress upon all farmers.]

2d. We can grow tobacco here so much cheaper than our eastern competitors (as I have above shown) that all can continue to raise the weed in Wisconsin at a profit when they have been frozen out of the business and retired. We have great confidence (here allow me to remark) that Wisconsin is destined to become the largest tobacco producing state in the Union. When we have crowded out the east we can double and treble our product without any danger of over production. Already the Connecticut Valley farmers talk of retiring because of slow sale and unprofitable prices.

3d. The secrets of successful tobacco raising cannot be transmitted by word of mouth like those of the Masonic or Odd Fellow order, they must be learned by actual experience and often expensive experiments. The shiftless, lazy or careless farmer need not expect to become a successful tobacco raiser, for he will make a miserable failure of it if he tries. It needs brains; it needs untiring energy and activity, and above all it needs men who can adapt themselves to circumstances and learn and profit by experience, men who read and keep posted on markets and information pertaining to their business, to make tobacco growing profitable farming.

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4th. History shows that many who start in at tobacco growing make a failure, become disgusted and fall out by the wayside. In 1881, prices were high; farmers everywhere caught the craze and the following season there was an increase of nearly three thousand acres in the state. The season of '82 proved a partial failure and the corp of '83 was less than that of 1881. The high prices of '83 when sales were made at twenty-five cents per pound, caused a relapse of the craze, so to speak, and again last season the acreage increased nearly four thousand acres. We believe that the crop of '85 will show a further increase of over five thousand acres. So that it will be seen that a partial failure or low prices act as a sort of check upon an over production.

In ten years the tobacco section of the state has hardly extended beyond a strip of country forty miles across. It will take another ten years before tobacco can become a general farm product.

5th. New beginners have no reason to expect that they will receive as satisfactory prices as the old and more experienced grower who has attained a reputation by years of hard labor. It is the skill and painstaking effort of the grower that tells when the crop is marketed. The wide variation of price is oftener due to the difference of men in handling them than any other reason. Buyers tell us that fully 10 per cent. of the tobacco is ruined by careless or ignorant handling even in the old districts. What the reputation of our state needs more than an increase in the number of growers is men who will bestow more care, time and attention to perfecting the methods they now put into practice. It can truly be said that tobacco culture is one of the fine arts of agriculture, and patience, perseverance and care are the three graces which lead to success. I have, in brief, outlined my reasons for believing that Wisconsin is not in any immediate danger of over producing her tobacco crop.

IS IT A SAFE CROP?

I think reasonably so. I cannot recall a total failure in the past ten years and only partial ones about as often as that of corn fails you. There are however, critical stages in its growth and curing when a single mistake in treatment

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or a misfortune in the shape of a hail storm or frost means a total ruin and it is to this class of unfortunates whom I leave to elaborate upon the "outs" of tobacco culture.

The average price received for our tobacco crops during the past ten years, falls somewhere between 10 and 11 cents per pound which it will be seen leaves a very fair margin to the producer. Our farmers can even accept still smaller prices and yet be able to reap a profit from this branch of farming.

I did intend to touch upon the Sumatra question but I fear I have now already wearied your patience too long.

With your permission allow me to read from the Report of Bureau of Statistics an extract touching this point from an article prepared by me which embodies my views on this question. (Page 221.)

To the officers and members of the State Agricultural Society now in session I desire to say that the attention and interest tobacco growing is now claiming from our farmers demands proper encouragement and reward from your hands. The meager premiums wich your society offered at its last annual fair on tobacco ($16 I believe) seems to me far too small and insignificant an encouragement of an industry that brings annually $2,500,000 to the farmers of Wisconsin.

Thanking you for your kind attention I beg to resign the floor to those older and better able to discuss the ins and outs of tobacco.

Senator Lord was called on and introduced as the largest tobacco grower in the state.

Senator Lord—I came here for the purpose of hearing Mr. Coon's dissertation upon tobacco. I would like to correct one error which you committed in the outset, in saying I was the largest tobacco grower in the state. I was at one time the second largest, but I have been compelled, for want of fertilizers, to decrease my acreage. I cannot say very much in addition to what Mr. Coon has said upon this question. A few years ago I read a paper before this association, in which I gave a general statement of the early his-

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tory of tobacco, which has been repeated by Mr. Coon very nearly, and the experience of the old tobacco growers of the state. As has been said here to-night, tobacco is one of the most profitable crops probably grown in the northwest, and the tobacco district to-day is in a better condition than any other district of the northwest, and perhaps of the United States. The questions which must affect us after this to a great extent will grow out of the importation of Sumatra tobaccos, and perhaps the ratification or rejection of the Spanish treaty. The Sumatra tobacco is grown by cooley labor, which costs the Dutch syndicate which controls that industry only six or eight cents a day, and is shipped to this country under the treaty with Holland, at thirty-five cents per pound. One pound of Sumatra tobacco will cover as many cigars as four pounds of ours, and makes very desirable goods for the manufacturer. That tobacco is from $1.25 to $1.75 a pound.

With the present tariff upon it we have but little fear of competition. We have more fear from the ratification of the Spanish treaty, but I have received a letter last Thursday from Senator Sawyer, acknowledging the receipt of a large petition from the dealers in New York and Philadelphia and the great commercial centers, in which he stated that his impression was that the Spanish treaty would not be ratified. The effect of that treaty would be to endanger the whole tobacco interest in Northern Wisconsin, Kentucky, Ohio, Pennsylvania, Indiana and Illinois. In regard to the future of Wisconsin tobacco, Mr. Coon has expressed my ideas except so far as this, that the other tobacco states have got to give way to Wisconsin. In Lancaster county, Pa., their lands are worth from $150 to $300 an acre. Their means of producing fertilizers are less than ours. The same is true of the Kentucky Valley, where they have lands worth $200 or $300 an acre, and are compelled to go to New York for their fertilizers. Wisconsin, with her comparatively cheap lands and her abundant facilities for making fertilizers, can produce tobacco at a rate which must eventually compel the other tobacco states to retire, and if our farmers here are prudent, as I said two years ago at the agricultural society,

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and do not starve their lands and reduce them to a level with the old worn-out lands of Virginia; in other words, while they are growing tobacco, if they will grow stock, prosecute the dairy business, seed down their lands, and manure them with crops of clover, they can go on raising tobacco for an indefinite length of time and keep up their farms and make southern Wisconsin the richest agricultural district in the world. We have here a strip of country which is especially adapted to the growth of tobocco. We find that going south of the Illinois line twenty-five miles, the crop deteriorates. You could not grow as good a crop twenty-five miles south of the Illinois line as you can here in Dane county and Rock county, and the same rule would hold good when you go perhaps fifty miles north of it; but anywhere in southern Wisconsin, and a small portion of northern Illinois, wherever you can raise a good crop of corn and mature it, you can raise Spanish tobacco. I never advise anybody to go into tobacco culture, but I would give the advice which the old secretary of the State Agricultural Society gave us when the Wisconsin Tobacco Growers' Association was organized. Gen. Bryant, I think, is a tobacco grower himself; he has been at any rate. He said, "Gentlemen, if you will grow tobacco, grow the best and ask God to forgive you;" and that, I presume, is about the way that a great many tobacco growers feel, but we find that the clergymen and everybody else will take our money which we get from the tobacco crop. They do not refuse to take the money, no matter what the physical or moral results may be.

In answer to questions, Senator Lord said that those farms that lie to the south are favorable for the cultivation of tobacco the same as for corn, but you do not want to let them wash because the old tobacco fields, after they have been cultivated for some time, are so loose that heavy streams are apt to wash them. A sandy loam with a southern inclination raises the best tobacco. If you can grow a good crop of corn and mature it perfectly, you can raise a good crop of tobacco.

Mr. Hinton—Do not the same reasons apply regarding

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the rejection of the Spanish treaty that would apply to the Sumatra tobacco, the cheapness of the labor with which it is grown?

Dr. Lord — Exactly.

Mr. Hinton — Is it not the fact that the tobacco of Cuba, where the finest tobacco probably in the world is grown, is raised mostly by cheap negro labor?

Dr. Lord — It is grown by cooley labor.

Mr. Hinton — That is, if anything, cheaper. That is one of the reasons why that proposed treaty should be rejected, so far as the tobacco interest is concerned.

Dr. Lord — Certainly.

A Member — What varieties would you recommend?

Dr. Lord — The tobacco growers have been divided in opinion until very recently in regard to the variety which will yield the greatest quantity. Spanish tobacco is the safest crop. It is free from many dangers that attend the larger varieties. It is a smaller tobacco, matures earlier and is not injured so much by hail, if you get a hail storm. It cures much more rapidly in the shade and commands a much more readier sale. The Spanish tobacco is the universal crop now in the state.

A Member — Can we get any books of instruction on this?

Dr. Lord — There is a work published on the cultivation of tobacco, a copy of which you will find in the state library. I think it is published by a Hartford firm. I would not advise anybody to follow it. I think you make a failure. In the transactions for 1883 you will find an article on tobacco, which will give you a general idea of its cultivation and some new growers for the last year or two have been following that, but even that can be improved. It was written as a general article on tobacco, giving the experience of the old growers, but my advice to you growers is to go into the tobacco districts and hire a good man who knows all about tobacco. Hire him by the month, or allow him a piece of land on shares. One such man in a neighborhood where a few new growers are going to commence would be invaluable; or else a grower can go into the tobacco district

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either in Dane or Rock county or a portion of Jefferson or Grant, where tobacco is grown, and note the working of some of the old tobacco growers.

A Member — I would like to ask whether this paper is read and these remarks made for the purpose of encouraging the growth of tobacco in the state of Wisconsin, or any action of this society is taken with that view.

Dr. Lord — No sir, I think not.

Mr. Fuller—If at this day and age you, my friends, with the power of brain you have, like to be entertained with a subject that has not a moral thread in it, it is worthy of your supreme intelligence to entertain one thought connected with dairying or connected with any of the branches of industry. Now, gentlemen, I have lived here forty years. I thought when I carried wheat from here to Milwaukee that I was laboring to an end in raising a family and trying to inculcate in them principles of industry and integrity, and now can any sane man entertain this audience with a subject that has not a moral thread in it from the beginning to the end?

Mr. Fish: If that agricultural question that has been talked about so much this afternoon had been raised in time so that I might have been benefited by it, I would like to have expressed myself, but as it is I have a few words to say.

Ladies and gentlemen, you have passed a resolution in favor of an agricultural college for your children, for the uplifting of the agricultural community. That kind of a school you are contemplating to-night for your boys. A young man from our neighborhood, just of late, has been down in the Janesville country, through the tobacco regions. He says he has been clear through it and learned the science. This man, when I came into the agricultural rooms down here, was the first one that I saw that I knew, and as I passed him by he sat in his chair with his cap on his lap, and as I looked in it I saw a half smoked cigar stuck in there. He did not act as though he was proud of it. This is what he learned, I suppose. Fathers, do you realize what you are doing? What do you propose to raise

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tobacco for? Are you willing to own that the material of which this society is made would stoop to an occupation the outcome of which is simply money? I have given a sample. I heard a story of a young naval officer in Virginia who came home for vacation. He had a new military suit, and he was out parading around the grounds. He came across one of the negro servants, and he says, "Jack, what do you think of my new suit?" "O, Massa," he says, "you looks just like a lion!" "A lion! did you ever see a lion? Where did you see a lion?" "Out there in the pasture." "Why, you old fool, that was a jack-ass." "Can't help it, Massa; you looks just like him." It is too bad that the great state of Wisconsin should be polluted by such a trade, when we have such a reputation, and then the inducements offered by the paper read before us to-night! When my eye fell upon this programme, and the subject which his paper was headed, I supposed that some inveterate tobacco user was going to stand before us and take a chew and spit out the chew. I thought that would be enough to illustrate the whole thing. But he did not look like that kind of a man. I do not know what his object was. Now, I want to introduce a resolution, in order that the tobacco subject be classed with the temperance question and left out of the discussions of this society hereafter.

Resolution referred to committee on resolutions.

Mr. True.—Where I took my meals this evening I looked around the table, and this gentleman that spoke over there was among the crowd, and they were discussing morals. I had a curiosity to know how many of them used tobacco. I mistrusted there were very few by the looks of the crowd, and come to hunt it up; in eight of them there were none of them that used tobacco in any form; my son and myself were among them. The gentleman that last spoke after the paper said he did not want to have anything said about the moral status of the question. Now anything that I was not willing that the moral side of the question should be argued I would not want to encourage. If I was raising good stock or anything of that kind, or doing good service in the line of farming, I would not want to be ashamed of my calling.

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Dr. Lord.—I was invited here to talk to these gentlemen about tobacco. If that gentleman who was shooting off his mouth had any objections why did he not say so? I was invited to come here and talk about tobacco. I waived the moral and physical effect of tobacco, and simply came here, as I was requested, to give my experience and some figures upon the matter. This discussion is taking a very singular range. I supposed there were gentlemen in the Agricultural Society of Wisconsin. I supposed I was mixing with gentlemen, especially when they had extended the courtesy to ask me to make a few remarks.

Mr. Ford.—The thing has opened so much sooner than I anticipated this morning. I thought that when we excluded beer from the fair grounds and censured the executive committee for using so much of it, that would soon have this question upon us. I think the executive committee ought to be prohibited from using tobacco, cigars, or anything of that kind.

President Arnold.—The chair would modestly suggest that he has known a good many individuals that claim they do not have any habits. If a man don't have any habits, I feel sorry for him.

THURSDAY, February 5, 1885.

Mr. Austin, of Clark county—As it may be, perhaps, a matter of a little importance to this convention, I will trespass upon your time a minute. I do not think this convention should adjourn, without a protest against the manner in which the discussion of a paper of the professor of Beloit college was left. I look upon this paper as certainly of great value, very important to every owner of a home in this or any other state, and I am free to say, as far as I am individually concerned, the line of thought, and the facts developed by that paper, paid me for my trouble and my time here the whole week, should I not learn anything else. The paper showed deep research and great thought in the interest of homes. The question was the purity of the water supply. I think I represent the feelings of the legitimate members of this convention, the farming and industrial

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community of this state, when I say that they look upon that paper as valuable, and that they feel very thankful for the labor expended upon it, and the manner in which it was represented to us. I do not think it is proper to invite scientific men here, and then insult them by telling them that the more science we have the less knowledge we have. I do not think it is a fact. I think we ought to deal in facts, and treat every man as he deserves, and I think that the commodity that criticised it in such a manner bears the custom-house stamp upon it. It is an imported commodity. It is not the natural tone of this country. It is not the sentiment of the American people, and I wish to enter a protest, in the name of the farmers, the agriculturists and the mechanics of this state, against that kind of criticism, and let it go abroad that we thank the professor of that college, that we feel deeply indebted to him for the effort he has made in our behalf.

Mr. Aaron Broughton — *Mr. President and Gentlemen:* In regard to this very question, theory is good for nothing unless it is verified by experience first. That is nature's operation. I do not wish to criticise the scientists in particular, but in fact the community has been deceived and overreached by scientists. They have established various institutions in this state, and an immense amount of expense has been entered into in that direction. I made a few notes when Mr. Smith's paper was read. They propose to regulate the affairs of the farmers, as to where their wells shall be located and all this. We can only judge from the light of experience in regard to this matter, yet we do not wish to be ruled and regulated too much. We had better learn what to do, and do it ourselves, without being taught by any aristocratic teachers of this kind. I think the paper is subject to criticism from an economical point of view. It would cost us immensely. Perhaps it might be better for the people's health, and it might not be. This fine-haired theory will mislead us immensely in regard to our health, and at immense cost. The question is, does he mean health of mind or health of body? The farmers are overloaded with taxes. Their families fairly suffer. The women have

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to work too hard and all this sort of thing, and to undertake to increase the burdens that are upon them by carrying out any such fine ideas will be too much for them to stand. In regard to bad water, what is nature's drink for man? Running water. There it is, plain and unmistakable. Where there is no running water there is no grass. There is a natural adaptation in regard to such matters, and in studying nature's laws we do not get fooled in regard to it.

Man was originally a mountain or hill animal, and in mountains or hills there is the rain for them. If there is no rain there is no grass, and consequently no water would be needed, but in all cases, with very few exceptions, there is the drink for them. In running water, the motion of the water purifies it, just as exercise is healthy for man. All you want to do is to exercise the water to have it healthy. If man was an evolution from marine life, it is plain enough that saline drink will not hurt him, because, if he uses salt he is only going back to nature, and, if salt is good for animals, it is good also for vegetables. Salt, as such, will not do any particular hurt. In regard to soluble and insoluble ingredients, we are taught by scientists, and they teach many good things, that minerals, even, were contained in solution in the primeval ocean, and by passing through marine life, either animal or vegetable, the acid bodies were precipitated to the bottom and became insoluble. That is what made the land. We must not get to be too fine in that matter, but we must study nature's laws, and adapt ourselves to them, then we will not have any mistake about it. Well water always is contrary to nature, most likely. Indians will drink out of running water rather than anywhere else. They do not like well water, neither do they like to live in houses. He speaks of water containing inorganic matter. Water that has percolated through the earth of course contains more or less inorganic matter. In regard to percolation, when running water percolates into the earth, and there comes a dry time, by capillary attraction it comes back to the surface and assists in furnishing food for plants. I do not wish to be very precise in regard to this matter. In regard to poisons, he says there are lead poisons,

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and all that sort of thing. It was told to Voltaire once that tea was a slow poison. He said yes, it was very slow indeed, for he had used it for eighty years, and it had not killed him yet. And even strychnine may be used for a long time in small quantities, and not do any harm. We have no time for splitting hairs ourselves, nor pay others for doing it, only but to a very limited extent. Splitting hairs is contrary to nature, and microscopical observations are contrary to nature, or else our eyes would be made into microscopes, and we must look out for these microscopical observations. If our eyes were microscopes, there is not probably anything on the face of the earth that we would eat, because we would see bacteria and such things everywhere.

President Arnold — From what this convention knows of Mr. Broughton, I do not think they believe he would be very much fooled by scientists or splitting hairs. A man that would carry a gold-headed cane like that which he carries, ought not to say anything about scientists.

Mr. Broughton — This was a present from the industrial man.

Mr. Gill — In regard to this paper that these gentlemen are addressing themselves to, I have listened to with a great deal of pleasure. Our friend who was on the floor first was criticising our friend Hinton. I am not going to take up the cudgles for him. I have no doubt he is able to defend himself anywhere. But, if I remember right, Mr. Hinton did make a point, and that is more than I have discovered in either of these two gentlemen's remarks. The point I understand him to make is, that the professor had in his paper directed attention more particularly to the water supply, and the that point Mr. Hinton made was it would be well enough to look in other directions as well as that one for conditions of disease. In that respect I think there was a point. Friend Broughton has criticised the paper to some extent on the scientific basis, something I am not capable of doing. I think that an every day farmer can benefit by that paper in one thing, and that is, to look at our own premises, when we get home, and see how our wells are situated in regard to manure piles.

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When traveling around, and when at home, for that matter, I see wells located in situations where I would consider them absolutely dangerous, and if that paper had no other effect than to call men's attention to that fact, and warn them of the danger, it would be valuable. In very many instances, in my opinion, it would absolutely be a great deal safer to sink a new well, or remove the hog pen or the dung pile.

President Arnold—A cane has been handed in to the secretary. Mr. Broughton says he was presented with this gold-headed cane by the hard working tillers of the soil, and right here he has presented a cane to Dr. Barry, marked: "Compliments of A. Broughton to Dr. Barry."

Mr. Broughton — The contrast is against me, I admit, but, considered scientifically, it is in my favor. Ask the scientists why it is so. This is from the industrial man to the scientific man, and they will probably fool themselves.

GOOD BUTTER VERSUS BOGUS BUTTER.

F. C. CURTIS, Rocky Run, Wis.

The subject as given me for discussion by Secretary Babbitt, opens up the whole butter question and gives a wide range for reasoning and argument. Most people are supposed to know good butter from bad, whether obtainable or not, but few, however, are aware of the nature and extent of what I presume Secretary Babbitt means by bogus butter. In consulting Webster, I find the meaning of bogus to be "a liquor made of rum and molasses" also "spurious" a cant term originally applied to counterfeit coin and hence denoting anything counterfeit; therefore I conclude bogus as here applied means spurious or counterfeit butter. Webster defines counterfeit "to copy or imitate without authority or right, and with a view to deceive, or defraud by passing the copy or thing forged for that which is original or genuine."

It requires no argument or proof to show that butter is counterfeited to a great extent, much greater than is gen-

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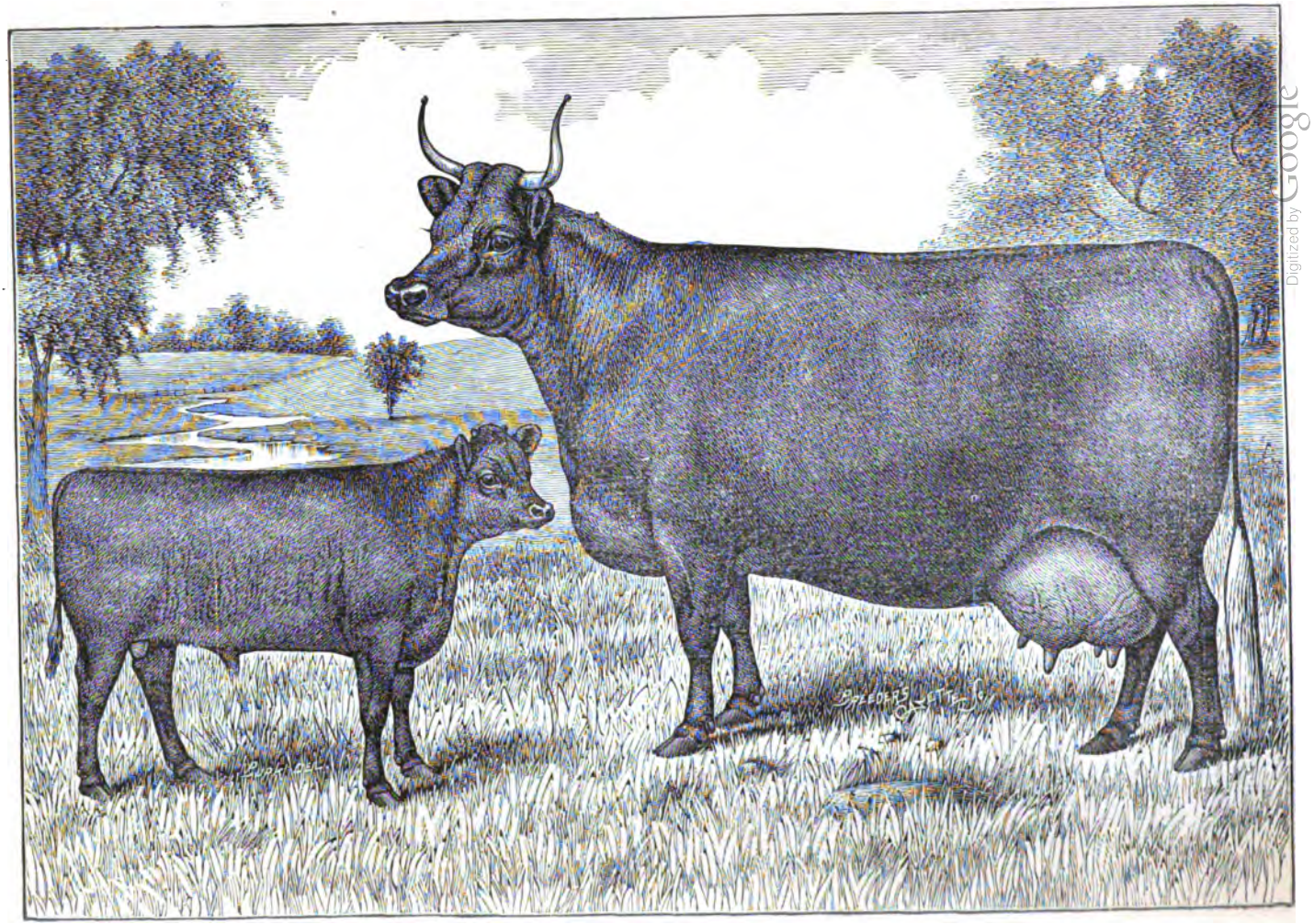

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erally supposed by those who use it. Counterfeiting in the general acceptation of the term is a crime, punishable by law, but in the case in question the law seems to fail to reach the criminal. I shall leave this part of the subject for the present and endeavor to show how it comes about that this bogus stuff has been foisted upon the people or rather how it became possible to commit so great a fraud without arousing the resentment of those upon whom the fraud is being perpetrated. If we were to go back fifty years we would find good butter to be worth from ten to fourteen cents per pound in late spring and early summer and the balance of the year a higher price, sixteen to eighteen cents, was obtained for good butter.

There was not so much difference then as there now is between the price of fresh made and good packed butter. By good packed butter, I mean butter that has been packed for some time and was so perfectly made that it remained sweet having acquired simply an aged taste characteristic of all good packed butter.

A large portion of the butter made in these times and packed for the purpose of keeping for a better market, failed to keep sweet; it was found to have acquired indescribable bad tastes, prominent among which that of rancidity.

During the season of scarcity of good butter, this bad packed butter was prominent in city markets.

Approaching the present time we find our cities greatly increased in population and their citizens clamoring for fresh made butter, almost totally discarding packed butter however sweet and perfect it may be.

We not only find this change but we find also a change in the constituency of boarding places. These are largely increased in number and capacity and the members thereof more ignorant of the character of the food furnished them, than formerly. One thing they wont have and that is rancid butter, or even good packed butter; this paves the way for bogus butter or something that looks like butter and will pass for it. Then again the capacity of the country to pro-

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duce a supply of fresh made butter in the cold season of the year is totally inadequate for that purpose.

The wiseacres advise us to turn off our poor cows and keep only good ones that will make two or three pounds of butter a day, to have them come in in the fall, so as to make the butter produce more even through the year.

That sounds very well, but it is very short-sighted advice, for to turn off the poor cows adds nothing to the general produce of butter. To buy cows yielding milk for two or three pounds of butter per day is almost an impossibility. Few cows will make over one and one half pounds a day, and to change any great part of butter making to the cold season of the year is a slow process, expensive in itself and quite unpopular to milkers.

The more sensible way seems to me, is to advise farmers to provide better stables, shelter and forage, and when the circumstances will permit, to have more cows come in in the fall, and then to instruct them how to make a good uniform quality of butter and place it upon the market in such a way as the market calls for it.

Almost all of the so called poor cows are better than they have credit for being; a most generous diet of such feed as they will digest will amply pay for the extra expense. It is not so much what the cow eats as what she digests and assimilates into her system, hence a generous diet of digestive feed is called for. To produce the effect in question, a large portion of the farmers of the northwest are well informed on this subject, are making it pay in ready dollars, and adding to the fertility of their farms, while a still larger portion remain in the old ruts, seemingly unable to receive or appreciate instruction; instruction that will not only relieve them of much laborious toil, but yield to more generous return in dollars and add to the riches of their farms.

The question is, have we this information to impart and can we *transfer* the information; I answer, yes, most assuredly, we have the evidence of years of practice and close observation. To give confidence to my hearers in my ability to teach what I profess, I cite them to the records of the Centennial Exposition, International Dairy Fairs at New

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York and Milwaukee, the Wisconsin Dairymen's Association and the various Wisconsin State Fairs. I have received repeated assurance that great benefit has been derived from my addresses on butter making. I will cite two cases: while traveling in the northern part of the state, a gentleman approached me in the cars, and said something like this "you don't know me, but I know you! my name is Cole; I live on Rock Prairie; I keep thirty cows; my wife and daughters thought they made as good butter as anybody, but when we sent it to Chicago we failed to get the price of best butter. Seeking information I heard your address at Elkhorn, went home and expended about ten dollars for the implements you described. The result was, we saved half of the labor in making the butter, and get ten cents more a pound for it right along. I am pleased to have this opportunity to express my thanks for the benefit derived from your teachings."

L. C. Miller of Tenhassen, Minnesota, writes me in substance, "That he was not raised a farmer, but had drifted into farming; that he heard my address at Mankato last February and thought my reasoning was so plausible that he would try butter making instead of selling his cream to the creamery. His friends laughed at him, but the result was after a little experience, he obtained thirty cents a pound for his butter in Chicago, through commission men," very near fancy Elgin prices.

He concludes by saying "that address ought to be framed in gold."

Some fifteen years ago I commenced making this subject a study and found from the good dairywoman, that it took about half a life-time to learn to make good butter and even then they did not always make good butter; that the result was quite uncertain; hence I concluded to investigate the matter with such resources as I could command. I became satisfied that the question of good butter consisted in good cows, good feed for them, good shelter and good care, generally, this insures good material from which to make the butter. The old plan of separating the cream from the milk, was to use the common open tin pan, which, for good

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result, required a uniform temperature of 62° and a pure atmosphere, requirements wholly beyond the ability of any ordinary farm house to provide; not only the inexorable fact, that the temperature must be 62°, there was no thermometer to assist in regulating the temperature, the finger being the theometrical test. Taking this view of the case, I set this plan aside, not only from the inability to command the proper temperature but from the absorbing power of the milk to absorb odors from the atmosphere, causing bad tastes to the cream and butter.

In taking this position I am aware that it is in opposition to Prof. Arnold who has instructed us in many good things.

In this instance I hold that the Professor, if technically correct, is really wrong in practice, or at least I hold his teachings will have a mischievous effect. It is well known that milk and cream in open vessels have great absorbing power of deleterious substances. I have before me the report of my kindred friend Dr. F. C. Curtis, of the New York State Board of Health, who was sent by that board to investigate the cause of the Enteric Fever at Port Jervis, N. Y., in November, 1883. The Doctor says, "the epidemic was one of true enteric fever; it made its appearance in a previously healthy locality; it arose suddenly and ended suddenly; it was limited to the village; it exhibited no local foci of infection; it affected several members of a large proportion of the affected families; eighty-seven per cent. of the cases occurred among persons using the milk supplied by one milk vender; one half of the families using the milk were taken with the disease; the persons using the milk constituted but five per cent. of the entire population, but two thirds of the milk supplied by this milk vendor was from a suspected source. The possibility of the milk becoming effected from the cases of the disease at the dairy farm is established; there was no cause affecting the subjects of the disease in common except the use of this milk. I would report therefore, that the epidemic was caused and spread through the medium of infected milk, the cause for the spread of at least three of the zymotic diseases (Typhoid Fever,

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Scarlatina and Diphtheria) has become a recognized fact since about ten years ago."

My experience and observation confirms me in the opinion that after milk is drawn from the cow the sooner it is put in a close can cooled to 62°, by being placed in cold water, the better the cream will rise, and that a more perfect butter can be made from the cream than can be made from any open setting within the means of any ordinary farmer. It is plain that the atmosphere is the great motive power in producing animal and vegetable life; that where life is extinct in the matter so produced the same atmosphere destroys or changes it. According to Johnston's Agricultural Chemistry milk is eighty-seven per cent. water, and thirteen per cent. other matter, mainly butter, cheese, sugar, etc.

That one hundred pounds of milk contains more pounds of sugar than it does of butter; this thirteen per cent. can be quickly destroyed by heat and can also be slowly destroyed by the action of the atmosphere aided by heat. Milk when drawn from the cow is 98°, blood heat, and unless soon cooled to about 62° this heat acts as a destroying power: hence the necessity of sudden cooling and bringing about this sudden cooling, which can be best done in tin cans about eight inches in diameter and about twenty inches deep, placed in cold water, we find causes the cream to rise mainly within twelve hours. Milk cools slowly and it will be found that cold water is a good conductor of cold to the milk when set into it, but care must be taken to have the diameter of the can which contains the milk, small enough so the milk cools to the center within three or four hours, or the animal heat it contains soon commences to destroy it. Ordinary well water is 49° and is sufficiently cold for this purpose; this we have in abundance hence by this system we can command the temperature we need for the purpose of extracting the cream, and in the meantime we shut out odors, insects and atmospheric influences.

It has not only those advantages but it is much less labor than the old fashioned tin pan.

There are a great many patented cans offered under this system. There is some advantage in paying a good price

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for an article; it makes one careful and attentive to follow directions but a common can eight inches in diameter twenty inches deep, close tin pail, cover with a small tube hole in the center of the cover and bailed handle, costing about sixty cents each I consider preferable to any can for the purpose of raising cream, and is really better than any patented device I have seen. Ice is a valuable addition to this system; some think they cannot do without it.

My well is over one hundred feet deep to which a pump and windmill is attached; about ten feet from the well, I have a cistern fifteen feet deep holding about two hundred barrels of water which is supplied by the well and pump.

The cistern has a curb or opening about two feet square, also a large pump to supply stock with water.

The cans are filled with milk to about three inches of the top so they will float and not be affected by the raising or falling of the water in that cistern.

Each can has an independent rope or strap for lowering, raising and holding it from floating out of position. The curb is kept closely covered so as to keep out the cold in the winter and heat in the summer, I have often tested its temperature and have not found it colder in winter than 45° nor warmer in summer than 55°. I consider it solves the main objection of keeping water cold for raising cream by this system and it certainly is a great acquisition to any farm where water is deep from the surface; a good pump with a five inch cylinder can be made to raise from one to two barrels of water per minute and the cistern itself need not cost over ten to fifteen dollars.

I consider this plan a very desirable one, though I give a wide latitude to any way that is most convenient, provided the water is sufficiently cool to cool the milk to the center of the cans in three hours to 62°. The milk can be skimmed in twelve or twenty-four hours and should not be allowed to become warmer than 62°.

In skimming, the cream, when added to other cream, should be well stirred together, so as to produce an even degree of acidity; no cream should be kept over three days without churning; a proper degree of acid produces the

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coveted nutty flavor in the butter product; too much acid destroys it.

If the cream has been handled as I have advised, it can be churned into butter at a temperature of 62° in the rectangular churn or other churns of a revolving character, which will be soon enough, and if so churned to granulation the butter, though intermixed with the milk, will be distinctly one thing and the butter milk distinctly another, and they can be separated by taking out the cork and letting the buttermilk run out; good, pure, cold water now added will rinse out the remaining traces of milk and leave the butter in a pure state in little granules about the size of wheat kernels. Should butter run out with the milk, draw off into a clean vessel and skim off the butter, or if the granules are fine, pour in water freely and float the butter.

The nice point is to allow the butter milk to come out itself which it will do if it has an opportunity; but, if it is massed in the churn and the buttermilk is well pounded into the butter, it takes that extra skill of the good old dairywoman to get it out without destroying the grain of the butter, and even then, however great her skill, care and labor, the butter is more or less injured from overworking and buttermilk remains in the butter to contaminate it.

Extracting the cream as I have directed, the use of the thermometer, and getting out the buttermilk while the butter is in a granulated state, is easily done by any person of common sense. This knowledge is easily transferred from one to another and if it could be got before the interested rank and file of buttermakers, I am positive it would have a great effect to drive bogus butter from the market.

If on the other hand the cream is too hot or too cold or of an uneven degree of acidity and churned in a five minute churn, a very uncertain product is the result; it may make butter in five minutes, or five hours, or not at all.

When the butter is churned to granulatation and the buttermilk is washed out and drained, the salt can be added, and by a rocking, half revolution of the churn it is easily seen the salt falls evenly through the butter after which a few revolutions of the churn will work the butter into a

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mass, and the butter will be ready to work and pack at once in a tub or other package.

It will be found that as the salt has become so evenly incorporated into the butter, and that there is no buttermilk to work out; all it needs is a little supervision and solid packing in the tub.

When butter is made, the old way of making it in the churn before the buttermilk is washed out and the salt added, the salt cannot be worked evenly through it, hence it must stand for the salt to dissolve and then be reworked, with the injurious and imperfect results as I have described.

Packing butter solidly in the tub is of great importance as much of the butter is retailed in cities by cutting up, the tub first being removed from the butter, showing the different colors of the churnings and imperfect packing.

The managers of creameries understand the necessity of packing solidly so as to give the butter a smooth appearance when the tub is removed.

Most dairymen would be surprised at the rough appearance of their butter when exhibited in this manner. A few examinations of their butter in this manner will tend to improvement in this particular.

There is probably no one feature of creamery butter that commends it above good dairy butter other than its uniform neat appearance in packing.

It is absolutely necessary that good salt should be used for butter.

Many private dairies still use the common barrel salt which was made for agricultural purposes, fertilizing land and salting stock, having all its natural impurities in it. It does not seem to be generally known that there is made at Syracuse, N. Y., an article of dairy salt equal in purity to the far famed Ashton, Higgins and other brands of English salt and can be bought of salt dealers at a small advance over common barrel salt.

I approach the subject of bogus butter with a great reluctance, for the reason that I know but little about it, and quite a number that I have appealed to for information also plead ignorance. True I had heard of it but had supposed that it

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was something for city use; that there was no danger of its contaminating the country.

In a late trip to New York, occupying three weeks I dined much of the time in dining cars, eating houses and hotels and I did not find genuine butter at only two public houses during the trip and that was at London, Canada, and at Lenox, Massachusetts. It was usually dealt out on a small butter plate, a little butter print duly stamped, looked neat but had scarcely any taste at all, certainly none of genuine butter.

Since arriving home I have dined at what I supposed were honest Wisconsin hotels and there was the same colored bogus staring at me in derision.

Once dining at an hotel with a brother farmer, who was using butter freely, I asked him if he had ever seen any bogus butter. He replied, "well I declare if this aint it, I had not thought of it, aside from the salt there is no taste in it."

I have received circulars from various parties urging upon me to buy the stuff they call "neutral" stating that it can be easily mixed with genuine butter and they even argue that it will improve its quality. They state they could give me reference were it not that all their correspondence was confidential.

I understand that this "neutral" is hog's lard, *i. e.*, when nothing worse, treated with sulphuric acid which destroys the lard, or other tastes.

I applied to Messrs. E. F. and J. D. Bacon, commission merchants of Chicago, Ill., for information on this subject. Their letter was long and interesting, but I will read only the following:

"We are of opinion that the adulteration of butter is reducing somewhat the consumption. For though it may taste all right many people abhor the idea of spreading their biscuit with the fat of hogs, especially is this true with the Jews, who as a rule abstain from eating the flesh of hogs altogether. While Americans, or those who do not hold to Jewish notions, though willing to eat the product of the

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hog, prefer to have it served up in a different manner and at the proper cost of the article."

The reply of Mr. E. A. Cortleyon, of New York, states that he has but little knowledge of his own on the subject, but it is generally understood that large amounts of the stuff were used in New York, but since the passage of the stringent law and prosecution of some sixty parties the sale of the bogus is demoralized and carried on more secretly.

Mr. Hoard — I may be able to give you, in a few words, a short synopsis of the New York law. The New York law starts out with the bold proposition of prohibiting, *in toto*, the adulteration of butter or cheese or milk; "No person or persons shall sell, exchange, expose for sale or exchange, any unclean, impure, unhealthy, adulterated or unwholesome milk, or shall offer for sale any article of food made from the same." That is the broad proposition. "This provision shall not apply to pure skim milk or skim cheese made from milk which is clean, pure, healthy, wholesome and unadulterated except by skimming. Who ever violates the provisions of this section is guilty of a misdemeanor, and shall be punished by fine of not less than twenty-five dollars, nor more than two hundred dollars, or by imprisonment of not less than one nor more than six months, or by both such fine and imprisonment for the first offense, and six months' imprisonment for each subsequent offense, etc. (Read New York law.)

The legislature of the state of New York appropriated thirty thousand dollars, and also appointed a board of chemists, if I remember rightly, and appointed a commissioner to see to the prosecution of this law, its thorough enforcement. A great deal of complaint has been made against the commissioner, Brown, and whether it is just or not is a very serious question with me. I was in New York last fall, and I investigated all I could concerning the matter. Very serious complaint has been laid against him because he has not shown sufficient energy in the prosecution of this law. The *American Dairyman* has criticised him in a way that indicates that he has only half a heart in the prosecution, any

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way; but, gentlemen, I say to you one thing, that in my candid opinion, something must be done. The judgment of the people must be crystallized somewhere against this unlawful exercise of greed. Generically and instinctively all men are selfish, and when the rewards of selfishnesss are greater than the rewards of honest dealing with each other, it does not take much to make a rascal out of a good Christian. I spent a week in Chicago in a quiet way. I had to be very quiet and careful. I convinced myself that the output of oleomargarine, made from the neutral oil of beeves, and butterine, from the neutral oil of hogs, was, at times, in Chicago, as great as the entire capacity of the butter manufacture of all the cows in Iowa and Minnesota. Seventy per cent. of this is neutral oil, and I submit to you candidly, when you consider all the capital that is at stake in the state of Wisconsin, take her 568,000 cows, and take all the capital that clusters and groups about them, and which is contributed to their efficiency, I submit if it is a fair show to make a living cow compete with a dead hog. It is not, and, more than this, if we, knowing our rights, dare not maintain them, we deserve what we get. Two things have been a matter of serious pain with me. In the first place, I do not know what to do myself. In the second place, I can not tell anybody else; and in the third place, others did not seem to be any wiser than I was. I did not know exactly what to do. I have been conferring this morning with Mr. Hazen on this matter. It seems as though the necessity was great. We may sit right down, if we choose, and let such men as Fairbanks & Co. destroy our interest, and we can fold our hands in a very meek, submissive manner, and say to those men, "thy will be done," but it does not strike me as though that was just the attitude for good, straight, hard-headed farmers, and I do not think they ought to submit to this thing. I think that the state of Wisconsin ought to have judgment and intelligence enough to crystallize a law something like this in New York, and men of executive ability enough to see that it is enforced, and I think that the farming element of the state would stand by it.

In answer to questions, the speaker said that there were

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manufactories in the state of Wisconsin making butterine. They offer to sell it for about six cents a pound. They are the ones to-day who keep up the price of Elgin butter as much as anybody else. They step into the Elgin market and buy large quantities of the best butter. The difficulty with that matter is that they are large consumers of our best butter, and, to the extent that they are consumers, they are not competitors with the best butter, and they inflict great damage upon the consumption of butter, and upon the consumption of the article all over the country. As an illustration of the fact that people do not want to eat this stuff, the output in Cleveland was ten tons a day, and this winter the Cleveland newspapers have picked it up, and have commenced agitating and telling the people about it, and they are about to pass a very stringent, severe law in Ohio, and the consumption of it has fallen off immensely. The people do not want to eat it. There is an instinct clear up from the drunkard to the healthiest woman on earth, against eating or drinking anything that is not the straight thing. These instincts, I believe, ought to be the basis of some action. I believe we ought to have a law against the adulteration of foods and drinks. I submit to the candid intelligence of the people this thought. A certain prohibition friend of mine one day said to me: "Dr. Bowditch of the state board of health of Massachusetts wrote letters all over the world on the relation of intemperance to crime, and the conclusion, and the sum of these letters was this, that 75 per cent. of the present crime that flows from the use of intoxicants is due to their adulteration." I said to him, "I submit that, if a law against the adulteration of intoxicants would cut off 75 per cent. of the crime of this country, it would be a good thing." "Then again," I said, "you would have this advantage, if you radical temperance men would unite on that principle you would have the drunkard with you too, and that is the first time you would see the community united."

J. C. Ford — Would you go further than to have a law requiring this oleomargarine or butterine to be distinctly labeled, so that people can know what they are buying, and

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if they prefer to buy this stuff, let them have it, or would you take the ground that the compound is deleterious ?

Mr. Hoard — I would take the ground that the compound is deleterious. The manufacturer relies, every time, upon the deception to the eater. To get it into the mouth of the consumer he relies upon deception. There are several agents in that thing, from the manufacturer down. First there is the grocer that knows what he is buying ; then there is the boarding-house hotel keeper and the restaurant keeper, they know what they are buying. You may label it as long as you are a mind to, but how are you going to label every particle of it, and every hair that is in it, so that the eater knows what he is eating ? It is difficult for legislation to reach out and effect the final consumption of it. That is where the difficulty lies, and labeling it seems to contribute not at all to prevent its consumption. You may talk about its being a perfect imitation. I think I have got a pretty fair butter taste. I think I have a pretty fair judgment. I have trained myself a good many years in that direction, and yet I have eaten butterine and oleomargarine that seemed to be as perfect butter as I ever ate, while seventy per cent. of it is neutral oil. The only way that it can be tested by the taste is, for instance, to open a very hot biscuit or hot cakes, and spread them, and if you have a very delicate taste you can once in a while catch it. There are chemical tests, and tests by acids and so forth. If you spread a piece of bread with it, and set it out in the sun, you will see the action of the rays of light upon it, and very soon the two oils will begin to separate, the butter fat and the animal fat. It is threatening the whole dairy interest of this country. At present it does not seem to threaten the cheese interest very much, though there are manufacturers that have been making it by emulsion process, taking an instrument that whirls about three thousand times a minute, and turning this milk and oil together, and that mixes it very thoroughly, and from that it is treated and run into cheese, putting in animal fat in place of butter fat, taking out butter fat that is worth thirty cents a pound and putting in

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animal fat worth six. First class butter is worth now in the Chicago market from twenty-five to thirty-five cents, call it thirty cents. Suppose you make seventy per cent. of oil at six to ten cents, and thirty per cent. of butter at thirty cents a pound, you make a compound that sells for twenty-five cents. The profits are enormous. Men say you must not interfere with that; it is a fair competition; it is a food product. I want to ask what guard have you, in the nature of things, of its being wholesome. If the fat of a hog is rendered, and it is a clean, healthy hog, and rendered properly, I am not prepared to say that it would be, in a certain sense, unwholesome. It is not as wholesome as butter fat. This is rendered at not to exceed 120 degrees. If it is rendered above 120, it imparts a cooked flavor to it. It is warmed up to 120, and then expressed by hydraulic power and the oil is divided. The neutral oil runs first, and that oil is used for this adulteration. It is not lard. You cannot take cooked lard, rendered at from 350 to 500 degrees, as it heats in the cooking, and mix it with butter, and churn it together, and make this stuff at all. Any man that has got any sort of a taste would detect it in a minute. You see you have not the protection of this high heat that you have got in lard. Any bacteria, or germs, or spores, or anything that is deleterious that may be contained in lard is destroyed by that heat, but at 120 it is not injured at all. There is the risk you run. Then again, what guard have you that these men in Chicago will not take oil from diseased and unfit and unhealthy animals? You have no protection at all. You take their word for it, and they are born liars at the start. The man that will come forward and undertake to impose upon the consumer, by telling me that he will furnish me oil which I can cheat somebody into eating, and tells me that I must take his word for it that it is healthy, that he has run pure neutral oil into that matter, forestalls my belief in the first place. What can we do? That is the conundrum.

Mr. Broughton — I have a few questions from a lady to be asked Mr. Curtis in regard to some practical matters pertaining to butter making. The first question is, why a tube hole is required in the cover of the can.

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Mr. Curtis—The cover I described was simply a tin pail cover, a cover going inside of the can. Sometimes the can will be full, or nearly full, and in putting on the cover the edges of the cover would go into the milk, and the consequence would be it would gush out. If there is a hole, the air would go out and the cover would go on without any trouble, and then, if desirable, it could be corked up, or it could be left open. Many people suppose that there is some subsidence in animal heat that wants to escape, and while I do not believe in that, while I do not believe that the animal odor is different from any other, I do not want to contest small points.

Mr. Broughton—Why not have the cover shut over on the outside of the can instead of the inside?

Mr. Curtis—If we put the cover on the outside, wherein is it any better than the inside? We find that cream rises best in a tin vessel or some vessel that is a good conductor of heat, and that the cream rises better somehow or other by close covering. I cannot explain why that is so. If the cover goes on the outside, that would represent the Cooley patent, which is a very good thing. Those who have them like them very much. The cover goes on the outside. But that process is patented, and that would answer the question shortly, that we cannot put the cover on the outside, and then drop it into the water so that the water goes beyond the edge of that cover; by doing so the milk is sealed from the atmosphere. It is water sealing. That is Cooley's patent, and we cannot use that, because it would be an infringement on the patent. In everything I have told you I have had it in view to give you implements right at your hand to use this thing at a very little expense; no apparatus to pay for.

To illustrate this, and show you you have got the means right in your hands to test this, I would say, take a simple glass quart self-sealing can, and you can try any kind of experiment, that will answer any question on this subject. Take a can and screw on the top, and it would be essentially the Cooley patent. You put it all over in cold water. You take another can of the same kind and put on

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the cover, and put it into water as deep as the milk, and you will find the result the same. You can look through the glass and see the depth of the cream. If our cream is made from good milk, in a quart can you will find that you have probably an inch and a half of cream. The quantity will surprise you, and you can see the length of time. You can set another can on the shelf, at any temperature you please, and you can look at that. You will find you have no cream at all in three hours, while in that time in the water you will find the cream is rising, both where it has gone all over and where it has gone as deep as the milk. There is no advantage in dropping in all over. My process, that I have described, is without any patent cans. You can get a barrel and put in a little ice, or lower it into a shallow well, or do any other way you please. I do not propose to tell you just what way to do it.

Mr. Broughton — Can you explain how or why cream rises within twelve hours in the manner you have described when it requires 36 hours for cream to rise in a common shallow tin pan?

Mr. Curtis — I remarked in my paper that cream was 87 per cent. water and 13 per cent. of other matter. I have remarked that milk cools slower than water, anything that heats slowly cools slowly, milk holds heat and cools slower than water. Of course the heating and cooling slowly is caused by that 13 per cent. of other matter in it. It is the 13 per cent. that holds the heat. In connection with that I will tell you another thing. We all know that many things contract and expand with heating and cooling. You know that particularly in the case of iron, but perhaps you have not thought that that would affect milk also. If you will take twelve cans of milk at blood heat, which is 98 degrees, and cool it to 49 degress, which is the temperature of well water, you will find that it will shrink about one pint. After it has shrunk one pint it will weigh just as much as it did before. Now I have told you that milk heats and cools slower than water, and that it is on account of that 13 per cent. in it which is not water. Now this is the answer to the question. Putting it in a vessel which conducts readily,

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such as glass or tin, and putting it in the water, you cool it suddenly, because water is a better conductor than cold air. You will naturally see that as water cools quicker than milk, that you cool the water in the milk first. That shrinks. It becomes heavier in proportion to its bulk and goes to the bottom, and the cream keeps its buoyancy and rises to the top, being lighter in proportion.

Mr. Broughton — How do you skim the milk?

Mr. Curtis — Just as you please. You can take a saucer or a tea cup with a handle. You can take a little soup ladle that will cost you fifteen cents, or get a tinner to make a conical shaped skimmer and let it down from the top. That is a very nice way. I want to give you something that you have all got, so that you need not go to any expense.

Mr. Broughton — How do you keep the cream after it separates from the water?

Mr. Curtis — We skim it off in the manner I have stated, and put it into the vessel. We have a large tin can. It holds about enough for twenty pounds of butter. We keep it sometimes from one to two days, stirring it always when we put in cream, to get an even degree of acidity. That is easily covered up and kept from insects or any impurities, and sets in the dining room or some place where it will keep about 62° during the time. I find that in that way it ripens well enough. I do not know but Professor Arnold or Brother Hoard will make some nice point and say that it might become oxygenized. The greatest trouble of the whole matter is with getting too much air. They say we have got to let it have air. I do not believe it is true. The sooner after milking we get it away from the atmosphere the better. The many peculiar tastes you get in bad butter are caused by some deleterious substance that may be existing in the atmosphere. Get it away from the atmosphere as soon as you can.

Mr. Broughton — What would be the bad effect if you did not frequently stir the cream?

Mr. Curtis — There would not be an even degree of acidity,

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and it would not churn easy. One part of the cream would churn sooner than another.

Mr. Broughton — How do you determine the degree of acidity and its temperature before churning?

Mr. Curtis — That is a simple thing in itself. It is so simple that I did not notice that particularly. It takes care of itself. Prof. Arnold said that we must leave it open for the atmosphere to act on it. I find that it is sufficient to keep the cream the length of time I have stated in this can, in this particular manner; that there is about the right degree of acidity there. It is a nice point to make. The proper degree of acidity produces flavor, but too much of it destroys it.

Mr. Broughton — How can you measure tho degree of acidity?

Mr. Curtis — You do not want to. If you will keep it about sixty-two degrees, you will be all right.

Prof. North — Even to three days?

Mr. Curtis — Yes, sir.

Mr. Broughton — How as to its temperature before churning?

Mr. Curtis — Sixty-two degrees. The greatest trouble that I have in talking to the butter women is, that many of them cannot even comprehend the fact that the thermometer will tell, but she knows that her finger will tell. In winter I would advise churning at sixty-four degrees, and in summer at sixty-two.

Mr. Broughton — How about sweet cream?

Mr. Curtis — I know nothing about sweet cream. I never tried it.

Mr. Broughton — If it is too sour, what difference do you make?

Mr. Curtis — I make no difference. I would simply find that the butter had lost flavor.

Mr. Broughton — How do you determine the point to stop churning, and determine the proper degree of granulation?

Mr. Curtis.—In any of these revoling churns you can determine it by the ear. That is something that I cannot quite describe, but you can soon determine that, when I hear a

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peculiar swash of the churn, churn a little longer and you will find it all right.

A Member.—Do you draw any buttermilk before you apply cold water?

Mr. Curtis.—I always draw the buttermilk if I can. If I had churned it judiciously warm I should put in the cold water at once; but if I could draw it I should. Sometimes I find that I have not churned it quite enough, and in commencing to draw off the buttermilk I find the butter comes out too much. Then I put in cold water and draw it off below. The finer it is when you draw it off the better. The sooner you cease churning the better, because you will get it in smaller particles. I draw off the buttermilk before I apply the water if I can.

A Member.—Do you ever put salt in the water in which you wash the butter?

Mr. Curtis.—I have tried it, but never found any good effects, and I never found any bad effects. I think I can remove the buttermilk just as easily with common water.

Mr. Broughton.—How much salt do you use to the pound?

Mr. Curtis.—One ounce.

Mr. Broughton.—Do we understand you to say you pack the butter immediately after churning?

Mr. Curtis.—Most certainly I do. I pack it at once.

Mr. Hoard.—Do you set your butter away after churning or let it remain a few hours and then rework it?

Mr. Curtis—I do not.

Mr. Hoard—I think you are sound. After the butter has been set away for three or four hours the grain becomes fixed. Then if you work it again you run the risk of extra manipulation.

Mr. Curtis—Certainly. The great trouble in all dairy butter making is over-working, and if we can get them to adopt this plan, there will be no trouble then. If you will follow the plan I have given, you will find the butter milk will go out of itself, and you will find that the salt will work evenly all through, and it does not require working only to get it solid. If you get it into a mass before you get the butter milk out you cannot get the butter milk out, and you

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cannot get the salt in evenly, consequently you have got to let it stand to dissolve, and then rework it, and as Mr. Hoard suggested, the butter has set, and it is about as easy to get it right again as to get mortar that has been set right for plaster.

A Member — What kind of a churn do you use?

Mr. Curtis — The rectangular churn.

In answer to questions Mr. Curtis stated: When I draw out butter-milk I take the covers off and throw in about half of the salt and turn the churn up, and you can see the salt fall through it. Then I put in the balance. This is after I have washed it with water. The water and butter-milk have all gone out. When you have put salt into butter that has been worked you have got to let it stand. Then you have got it into a condition that it calls for the skill of the lady who has taken half a life-time to learn to get the salt into that and get it evenly worked without ruining it, and she will, ninety-nine times out of a hundred, injure it, and that is why we have such an un-uniform character of butter. In this method the salt goes evenly through it. I turn it then, after I get it in there, and work it into a mass. I take it out immediately onto a flat surface. I have got a tray on purpose, about three feet long and about a foot wide. I take three or four pounds out with a common butter ladle and flatten it out a few times, roll it up and put it into a tub, and with this common old butter ladle I pack it as solid as I can, and with a potato masher, or a stick of wood prepared for the purpose, stamp it solid. In doing that you work this all out. Your salt is now evenly through that butter, and in a short time it dissolves to some extent and produces a moisture in the butter. In the other plan, of massing in the churn and reworking, the salt is dissolved and the brine all worked out. You then have a dry butter. Place this on the market for an expert to try it. He puts his trier into that that has been reworked, and almost invariably it shows stickiness, at least dryness. They do not want that. They do not want dry butter; that is, strictly so. They do not want it too moist of course. But treated in the manner I have stated it will come out nicely

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and be just what they want. Your butter will weigh more and they like it better.

Prof. Armstrong — I would like to ask you, or any one else, if you have observed any effect on the temperature of churning of varying the feed of the cows.

Mr. Curtis — No.

A Member — How do you determine the amount of butter the way you sell it?

Mr. Curtis — The same as we used to determine how much a bushel of grain was. We had a half bushel that would hold a half bushel, and we supposed it would measure accurately enough. In this instance our cream is of a similar character and quality and I know how much it makes. It will not vary half a pound, and that is near enough for all practical purposes. I get at the weight by approximation.

Mr. Broughton — Is not a stone jar a more proper vessel than wood or other material to pack butter for long keeping?

Mr. Curtis — Certainly not. Most usually it is a vessel that has been used before for the same purpose, and it is almost impossible to cleanse it. There are little fire cracks and the like of that, that the old butter has remained in, and unless it is very particularly cleaned there will be impurities in there which will act as leaven to make the whole butter rancid.

Mr. Broughton — That would not do for milk.

Mr. Curtis — No, sir; I would have good, new, clean wood every time. I churn until the butter arrives at the granular state, about the size of wheat kernels.

A Member — My experience is that if you stop right there, in churning, it seems to separate better from buttermilk. It won't separate unless you draw it out and strain it, or something of that kind.

Mr. Curtis — Pour in water freely when you are troubled in that manner.

Mr. Ford — The committee on resolutions desires to make a report.

Resolved, That this convention favors the passage of Bill No. 96, A., establishing a state weather service.

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The bill appropriates the sum of two thousand dollars for that purpose.

Prof. Armsby — *Ladies and Gentlemen* — I will take but a very few moments of your time. My object in introducing this resolution was simply to lay the matter before the convention for the purpose of getting, if possible, an expression of their opinion as to this project; and all that I desire to do now is to state briefly what a state weather service is, and what it aims to accomplish, particularly for the farmers. A year ago last fall, in the early part of September, the United States signal service telegraphed to this city a warning of a frost which visited us about 48 hours later. They telegraphed here warning of that frost from 36 to 48 hours before it came. That telegram did not go out of the telegraph office here, for the reason that there was no one here whose business it was to receive and to distribute the information. The officers of the signal service, of course, had no means of distributing it, except through the press. If there had been some one here who could have sent warning of that coming frost to certain points in the state, I suppose there is no doubt that a very considerable benefit would have resulted, particularly to growers of tobacco. Now the first object of the state weather service is to distribute throughout the state promptly, warnings of approaching frosts and cold waves. These frosts and cold waves can be predicted with very great certainty by the United States signal service, and they will send free of cost a telegram to the director or chief of the state weather service announcing the approach of such a frost, and the state weather service would arrange before hand to send by telegraph to as many points in the state as possible, and if possible, to every telegraph and telephone office in the state, a notice of that warning, and would arrange to have at those points warning flags displayed, and would arrange further in some way, by means of stage lines or special messengers, to reach those districts which were remote from telegraph or telephone offices, so that those who might be in need of such a warning to save their crops would have as much warning as possible.

The second object of such a service would be the sending

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out of daily predictions of the weather for the coming 24 hours. I will not say much about that, because I regard it as one of the least important objects. That is done in some states quite satisfactorily, particularly in Ohio, the predictions being telegraphed from Washington, prepared especially for that state. That I will pass over in a few words, because I do not think it is a thing which should be undertaken by the state service, at first, at any rate. The other, and the last one which I shall mention, is to establish volunteer stations throughout the state. The bill provides, if possible, for one in each county at least, to take observations daily of the temperature and the rainfall, the idea being to get, in this way, statistics of climates of different regions of the state, particularly the average temperature and the amount of rainfall in different seasons of the year. This would be done by volunteer observers, who would send their reports monthly by mail to the chief of the service, and he would tabulate them and publish them in the form of a monthly bulletin. The benefits of this, of course, are not so immediate or so obvious as those resulting from the frost warnings, but in time they would be, I think, even more important, as showing the adaptation of different regions of the state to different crops or different systems of farming, for example, the differences in different parts of the state are much greater than one would suppose. In the comparatively small state of New Jersey, for instance, the rainfall in one portion of the state, in a particular year at least, was about twice what it was in another portion of the same state, perhaps not two hundred miles apart. In one case, in Illinois, the weather service was able to predict a poor corn crop from the fact of the poor rainfall in the early months. In that way information might be furnished which might be of considerable value.

It might be of considerable value to the farmer to know whether the corn or wheat crop was likely to be good or poor. There would be benefits also to the other branches of business, particularly to engineers, in knowing how much rainfall to provide for, and what weight of snow on roofs and other things of that sort might be expected, and

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the sanitary relations of it would be somewhat important, but at the same time, the benefit would be more particularly to the farmers of the state. The bill before the legislature provides for such a service, and appropriates two thousand dollars annually for its expense. These services are now in operation in fourteen states. I cannot give you at this moment a list of them. They are largely in the Mississippi valley. The Ohio service is one of the best, and the appropriation for that is the same as is asked in this bill, namely, two thousand dollars. I shall be very glad to have an expression of opinion from this body as to the desirability of the measure. I introduced the resolution for the purpose of getting an expression of opinion, whether the service proposed would be of value to the farmers of the state, and of enough value to warrant the small expense. The bill lays upon the State University the duty of providing free quarters for the central office. The bill provides, I think, five hundred dollars for the director, to be paid from the treasury of the state. The running expenses are to be audited by the board of regents, who will act as a board of audit. The appropriation is specifically for this purpose, so that if any is left over it will be put back into the state treasury.

The resolution was then voted upon and adopted.

Mr. Broughton — I recognize in this gentleman, Dr. Barry, a gentleman who has performed eminent services for the industrial man, and would like to present him with some token of their regard. The gold headed cane which I carry seems to represent aristocratic wisdom. It represents polished nonsense. But this wooden cane, Dr. Barry, while it has no great intrinsic value, is valuable because of the associations that are connected with it. It is simply hickory. If it were fifty years ago it would have a political taint, a democratic taint, an Andrew Jackson taint, but now, at this time, it seems to be divested of that. It has been sand-papered and varnished. I would not intimate that the principles of the democracy have been sand-papered and varnished, by any means. I wish to keep that allusion entirely out of sight. The hickory represents toughness, endurance, and all that. It used to represent "to the victors

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belong the spoils," but now it represents the toils of the industrial man, and because of the grateful remembrance held for your eminent services in representing to the people of this state the importance of agricultural education, the importance of the elevation of the industrial man in his intellectual development, I present you with this cane.

Dr. Barry — *Mr. President:* Like all young men, and those unaccustomed to stand in such a presence as this, I feel myself laboring under a great embarrassment, and I fear that, in my attempt to reply to the very excellent speech of presentation that has just been made, I can only make reply in a stammering and stuttering way, and shall hardly be able, under the circumstances, to say just the right word and in the right way. I have been a citizen of this grand commonwealth for forty years. I have endeavored so to conduct myself always as to merit in some small way the approbation of the citizens of Wisconsin, and now, when my frame is feeble and my head is silvered o'er with age, and I feel that my earthly journey is nigh completed, for the first time in my life I must stand up in the midst of a crowd like this and submit to be caned; (laughter). And it is simply the outcome of what transpired a few years ago, when a considerable portion of those who called these my friends set a watch over me, and now, as the result of that watching a caning!

Mr. President, allow me, through you, to tender my sincere and heartfelt thanks to the donor of this stick for his excellent favor, though in a little while I shall be seventy years of age yet I need no stick to support my steps, and, as always, so now, I find my strongest staff and stay and support in the kindness and confidence and esteem of my fellow citizens of Wisconsin. (Applause.) Always have I been favored by them a great deal beyond what I have deserved, though always I have striven to serve them to the best of my capacity, and I have only to say now, in conclusion, as I would say to my friend Broughton here, saying to him I would say to all with whom I have been and am now associated in any labors, please draw on me at any time for any help I can render, and I shall only feel myself too highly honored in

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honoring your draft; and now the benediction of Tim, Tim, God bless us, every one.

Mr. Hoard.— I want to offer the Irishman's toast to our dear old Patrick here, "may the Lord God take a liking to you."

FORWARD MARCH.

By C. D. Fox, of Illinois.

It is said of a celebrated Greek scholar that when he came to die he expressed the regret that instead of devoting his life to the Greek noun, he had not restricted himself to its dative case. His sense of the incompleteness of his work was so great that it made him wish that he had undertaken less in amount, but more thoroughly. Something of the same sense of incompleteness has followed since my own effort of a year ago on the subject of wind power on the farm, the theme was acknowledged to be new to me in many respects, while in others more familiar, so many suggestions were left unmentioned, and so many applications unestimated, that it seemed to me that the matter was hardly more than stated, and not developed. To satisfy my own sense of what the subject requires, and at the same time comply with the invitation of your secretary, I have decided to supplement my last winter's paper with a few more words on "wind as a farm motor."

Furthermore, while I am not prompted to appear before this convention by the expectation of imparting anything of importance to the farmers of Wisconsin on the general subject of agriculture, yet there may be some things developed in my efforts to utilize one of the most fickle and erratic forces of nature that may be of interest.

In any event if I do not take away with me more of value than I leave, it will be because I am a poor scholar.

"Forward March," is the watchword of our age and country. It is also the motto of this paper.

In the paper of last winter referred to, this point among others was made, namely, "The geared windmill on the

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farm is a valuable school of mechanics," and it may be added that like all educational agenies it is not limited in its influence to the farm on which it is located, nor to the farmer or his family who erected it, but it awakens new interest throughout the neighborhood, and here and there some sleeply-head is aroused, as a new influence and zest is given to what may have come to be regarded as hum-drum farm life, and I want to predict that some of these farmer boys will yet be heard of in the world of mechanics.

But all are not thus favorable affected. There are the old fogies that see nothing of value in anything that is not at least a hundred years old, *centennial celebrations* is there glory. Then there are the hypocritical ones that see imperfections in everything, and so jog along from youth to hoary age in the same old rut. Also the stupid ones, who look on a new piece of machinery, or a new process with the eye of an ox looking at the stars, eyes as expressionless a gopher-holes.

But I am happy to say that the great majority of my visitors are interested to the verge of enthusiasm, especially that class of farmers and mechanics who have given some attention to matters of this kind, professional men also, and domestic and political economists express themselves highly gratified.

Prompted by these expressions of sympathy and encouragement, together with the relief from a large per cent. of the labor of the farm by the use of the windmill and attachments, I shall prosecute with fresh courage this study the coming season, and *onward march* with a firmer step.

A year ago I had not found a corn-sheller quite to my liking. They require too much power in proportion to the work they perform, to be run to advantage by a windmill. And, besides, it occurred to me that it is practicable to so construct a corn-sheller that it will shell corn in the husk to advantage. Accordingly my rainy days and spare hours have been largely devoted to perfecting a sheller that will meet these requirements, and have produced one that fills the bill exactly to my liking.

At the risk of being tedious I will describe it.

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Remember the lesson before us is how to construct a corn-sheller that will do a maximum of work with a minimum of power; that will shell husked or unhusked corn, deliver in sacks or other receptacles, and deliver the cobs whole, or the cobs and husks crushed for fodder as desired.

Consider first the nature of the work to be done, and then adopt the simplest mechanical means to do it, that is the perfection of invention.

If we undertake to shell an ear of corn off over the point we will find it difficult and requiring the largest amount of power, and yet most shellers are constructed on that plan. If the ear is turned end for end the shelling is comparatively easier, but it is not practical to feed in the corn uniformly that way. But if a row or two be removed from end to end of the ear, the rest is easily shelled, if in good condition it will almost shell itself. If corn in the husk is to be shelled, the sheller must be so constructed that it will not clog either in receiving the corn or in delivering the cobs and husks, and there must be no pulleys, shafts or journals to be wound up with the husks and silk. Such a sheller would be regarded as the ideal sheller.

To meet these conditions all that is necessary is a ribbed cylinder, a ribbed cap or cover, and a perforated bed, with suitable enclosed frame, bearings, boxes, etc., and carriers to convey the corn to the sheller, and the cobs and husks away.

For a 16 foot windmill the cylinder should be 22 inches in length, and the same in diameter, increasing or diminishing the length according to the power used; the cylinder, if made of wood, is mounted with eight horizontal ribs of iron, half an inch square, securely fastened. The cover or cap is an irregular segment furnished with iron ribs similar to the cylinder, and wide enough to cover one-third of it, it is so hinged to the frame over the cylinder that it moves freely up and down, but it is rigid in every other direction, and is of sufficient heft to secure the shelling. It is so hung that the front of it will be directly over the center of the cylinder, and three or four inches from it, and the rear rests on stops showing a half-inch space between the ribs when pass-

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ing. The bed is a perforated concave in sections, of the same length as the cylinder, a little larger, and wide enough to underlie one half of it. The cylinder and cover, if made of cast iron, may be suitably ribbed in casting.

The carriers may be of any pattern or material that answer the purpose; the cob-carrier being perforated in a portion of its bottom, so that any scattering corn which is escaping with husks may sift out. No balance wheel is necessary as the weight of the cylinder gives all the momemtum required. The cylinder being supplied with shaft, journal and shive to connect with main shaft— I use ropes — and the cylinder being nicely balanced, it is ready for work. The carriers are operated from cylinder shaft, the cob-carrier by cross-belt, as it runs in the opposite direction. The best speed of the cylinder is about 250 revolutions per minute. The frame — a cross-legged one preferred — should be high enough to raise the top of the cylinder at least six or seven feet from the ground. The carrier that conveys the corn to the cylinder must be wide enough to accommodate the longest ears, and supplied with horizontal slats, fastened in the center to a single belt, and run up an incline as steep as within about fifteen degrees of perpendicular, so as to encourage the ears to drop horizontally on to the cylinder.

The operation of the sheller, from this description, will be readily perceived. The ears, husked or unhusked, are thrown by scoops or baskets, at haphazard, into a receptacle at the foot of the corn-carrier, and inclining to it, from which it is carried up the incline, and dropped horizontally on to the rapidly moving cylinder, and, being caught by one of its iron ribs, is dashed with great force against the first stationery rib in the cover, where one or more rows are instantly removed; and as it has six or seven more to pass in the same manner, the cob has to leave the sheller as clean of corn as though it hod been run through a turning lathe, and the husks, being finely stripped, and most of them detached from the cob, are ready for market if not wanted for fodder.

I expected the kernels would be left more or less at the

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tips of the ears, but was agreeably disappointed; and no marvel, when we consider the ribs of the cylinder are flying at the rate of fifteen hundred feet per minute, and carrying the ears under a close-fitting cover, similarly ribbed. Close dodging, you see. And I am not surprised to find that it makes little or no difference as to the condition of the corn, as to whether it be wet or dry, sound or soft, big or little, or mixed. An ear cannot get through the sheller, running at fair speed, without getting shelled or crushed, most likely both.

By raising the cover at its lower edge the corn can be sorted, the soundest and dryest being shelled and cleaned, ready for market or mill, and the damaged corn, which is usually tough, passes off with the husks for sheep feed.

The wind generated by the motion of the cylinder is utilized by a simple devise, for cleaning the corn, without taking the wind mill or other motor for power to run a fan.

The capacity of the sheller is limited only by its size, power used, and facilities for handling the corn.

So much for the "Hackburry Corn Sheller",—next in order was to hit on a scheme for separating the straw from the grain in threshing, with the least possible tax on the windmill, the "New Champion", manufactured in Berks county, Penn., is all that can be expected so far as threshing is concerned. It is an "overshot" machine, and by removing the thumb-screw that holds the concave down, and simply weighting it according to the nature of the material to be threshed. It is next to impossible to injure the machine by letting any hard substances pass through it. I am now threshing my second crop and have not even loosened a tooth in either cylinder or concave.

The theory is that by this simple modification there need be no provision made for replacing broken or loosened teeth as they will keep there place till worn out, and anything can be threshed without injury, from beans or buckwheat, to rye or spring wheat.

But their plan for separating the grain from the straw requires too much power to make it available as a windmill attachment; it consists of a separator given an oscillating

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motion by means of wrist-pin, face-plate and Pitman, and of course such a motion by such means will take the vim out of a windmill under ordinary circumstances.

A smooth circular motion is what is wanted to do heavy work, with the geared wind mill. and the following cheap and simple devise seems to fill the bill admirably, for the work under consideration. A series of rakes are made to revolve around a frame-work constructed much after the plan of an ordinary straw-carrier, the rakes taking the place of the slats, and the rake-heads running within about three fourths of an inch of the bottom boards of the carrier. This is set in position facing the cylinder, two or three feet from it and so that the grain and straw when discharged from it, will strike the carrier, say three feet from the bottom. My thresher is elevated so that the discharge of straw is seven feet above the floor, giving room for a liberal pile of grain underneath.

A slow easy motion to the rakes is required, and this is secured by coupling with belt from a two-inch pulley on cylinder shaft, to a three-foot pulley on lower shaft of carrier. The carrier is set on an angle of about fifteen degrees from perpendicular, and may extend to any height desired, even out at the top of the barn, for if constructed with precision and set with care, if twenty feet in height it can be run with the power of one finger, as our mothers used to turn the old-fashioned spinning wheel.

It will be seen that the grain and the straw are discharged from the cylinder in the midst of these upward moving rakes, the grain by its gravity slides down behind the rake heads, and is deposited underneath, while the straw is carried upwards and pitched over the top in the opposite direction.

When there is plenty of wind I sometimes set my fanning mill under the foot of the carrier, connected to the cylinder shaft in the same manner. The grain and chaff falls into the hopper instead of on the floor, thus saving once handling. Both carrier and fanning mill are not half the tax on the power as the separator that came with the thresher, and that only separated the straw, and required the constant

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attention of one hand. I am this winter threshing considerable hay for the double purpose of saving the seed, and also in a good degree freeing the dust from the fodder. It does it to a charm.

It seems to me a similar plan can be adopted to advantage in the construction of large threshers and separators, and dispense with a large number of parts, bearings, and hard awkward motions.

The perfecting of the corn-sheller and separator to be run by windmill as well as other power, is the extent of my own personal endeavor in that line during the season, though I have several other improvements on hand, which, if on trial prove of sufficient merit to warrant it, the public may hear from them,— if not, they will never see the light.

In the meantime others have been working in the same line and with marked success. During the season I have thoroughly tested two patterns of feed grinders, especially adapted to the windmill. All who have had experience in this line have learned to their cost that it is idle to try and run a grinder that is designed for steam or horse power, by wind. No trouble in a gale, but the important point is to have our windmill attachments adapted to either moderate or high wind. Consequently most of the standard grinders, as the "American," "I. X. L." "Raymond," and others, though deservedly popular when there is no lack of power behind them, signally fail when attached to the windmill, unless it be a larger one than most of us feel able to own. I have tried, and seen tested several patterns, and am pretty well qualified to judge.

My favorite grinders for wind power are the "Eclipse," and the "Wonder," both brought to the notice of the public within the year. The "Eclipse"—inventor unknown to me —is entitled to just claims of superiority. First, from the ease with which it will start when loaded. Most grinders, if the motion goes down when full of grain, cannot be started again without help, owing to the dishing shape of the plates permitting the grain to wedge in between them. The Eclipse plates are parallel across their face, and set horizontal, which, with its center feed and automatic device for regu-

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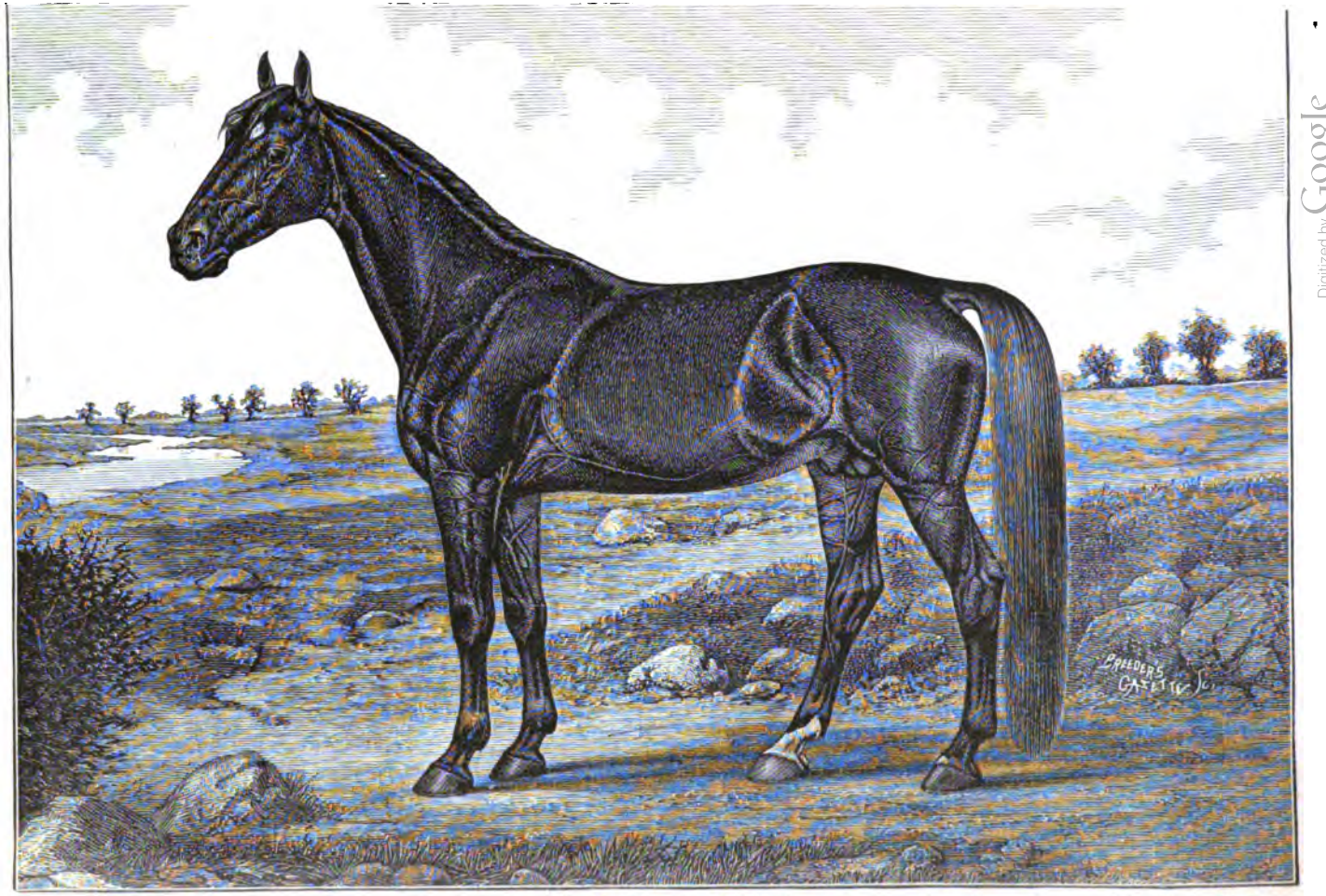

PHALLAS. Record 2:13¼ in a fourth heat and race. Sired by Dictator; full brother to Dexter. Dam Betsey Trotwood, by Clark Chief.
Property of Hon. J. I. Case, Racine, Wis.

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lating feed just according to the motion, no more grain can be fed in than the same power will grind and discharge, making it completely self-regulating. Second, it grinds rapidly because the parallel position of the corrugated surface of the plates gives efficiency to nearly the whole grinding surface, instead of having the outer edge merely do all the finishing work. Third, it requires less power, as there is little or no friction caused by the wedging or crowding. Fourth, it is strong and durable, being made wholly of iron, and easily adjusted. And fifth, it is furnished with a cone-pulley, and is readily accommodated to the varying velocity of the wind.

The "Wonder," named for its wonderful execution, the invention of Westway, is a complete novelty in the line of grinders. It is *sui generis* in structure and operation, and therefore difficult of description by a novice. The following may give an intelligent idea of it. The object of the inventor seems to have been to produce a grinder that would do execution in quantity and quality with the least possible power; a maximum of work, a minimum of power. I think that he has produced a grinder that, like the "Hackbury" sheller, is limited only to the power used, and the facilities for handling the grain and product.

In general it may be characterized as a combination of the disc and roller processes of grinding. It consists of a roller made to revolve by an independent motion at right angles with, and over against a swift revolving corrugated disc. Immediately below the roller, and together with the rolls setting over against the disc is a corrugated plate equal in superfices to about one-sixteenth that of the disc. It is held firmly in position to within a hair's breadth of the disc facing a half diameter of its corrugated surface. The hopper, supplied with an automatic shake, is placed immediately over that point of conjunction of roller and disc, so that the roller serves the double purpose of crushing the grain by bringing it in contact with the disc, and of furnishing a complete forced feed. The crushed grain in leaving the roller is drawn between the plate and disc, which

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gives it the finish. It will be seen that the friction surface of this grinder in grinding is very small, the plate and roller covering only one eighth of the face of the disc. This small friction surface makes it a very easy working grinder. Another feature is the cooling effect produced. The revolving disc by its being relieved of friction contact, seven eighths of the surface of the disc, the exposure of the greater part of the disc in its revolving creates an air blast upon it, keeping it and the grain ground by it cool. Now as the grain is ground by a small friction contact to start with, there is the least amount of heating in the discs to heat the grain. This small amount of heat is cooled off by the air blasts above described, leaving the meal as cool and dry or dryer, as the corn from which it was made. This air blast also keeps the mill from gumming, even though the grain be damp. The grain being crushed by roller is reduced to meal much easier than if all done by friction. The feed is governed by the speed as in most grinders, and is practically self-regulating.

It will be seen that the quality of the produce depends simply upon the precision with which the grinding parts are set. There is no difficulty in making meal of the best quality. A remarkable feature is that it makes but little difference, as to time, whether it grinds fine or coarse. When set to any particular grade the product is uniform. As to speed of execution, keeping strictly within bounds, I will say I have ground a bushel of clear corn inside of three minutes; and corn and oats, half and half by weight, inside of two and three-quarter minutes, with my 16 foot windmill, equal to about three horse power, in a fair working wind. This is the most complete iron grinder that has come under my observation.

These two I procured of the Eclipse Wind Engine Co., who. I understand, are now manufacturing them on their own account. But I suppose they or some one else will soon discount them as much as they discount the old ratchet grinder we first used, and called a perfect success, because the world is on the forward march.

As to the economy of feeding whole or ground grain

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there is a difference of opinion; my opinion is that it depends altogether on circumstances. If a person is so situated that his milling has to be done away from home, three, five, or ten miles — has to stand all the wear and tear of that most disagreeable of jobs—for whoever went to mill and got home again without getting into a storm of rain and sleet and mud, and especially if his grist is tolled (or stoled and we all know what that means), he had better by all odds feed his grain whole, but if on the other hand he has the modern improved conveniences for doing his own grinding in connection with his chores, by a power that is used for a half score of other purposes on the farm, and is therefore at merely nominal cost, and with a grinder that tends itself, so that in the meantime he can attend to other matters, eat his meals, or read his newspaper, or milk his cow, or feed his pig, why in that case I would feed meal liberally to everything, "from every horse that neighs, to every mule that brays," "from every cow that loos, to every cock that crows," "from every pig that grunts, to every sheep that bunts," and save twenty-five per cent. by doing so, to say nothing about the grand satisfaction of having every animal on the premises fat and slick; besides to always have a supply of good sweet meal, or graham, or buckwheat flour at hand for table use, is no trifling object for one who is fond of hog and hominy, johnny cake, pan cakes, and fried pudding as is your humble servant.

Another novel and convenient use of the windmill I have found is the manufacture of ice, especially if there is no body of water convenient or suitable from which to harvest a crop, a simple pumper will answer every purpose. Unless a force pump is used, the ice-house should be eight or ten feet below the pump, and as many rods away from it. The water is conveyed in open troughs to a point over the center of the ice bin into a cullender to facilitate freezing. The bin need not be remarkably tight; in our coldest northern winters a rail pen chinked with straw will answer. In this way I once formed a solid eight foot cube of pure clear ice in eight cold nights, using night for this purpose to economize time. When the thermometer indicates twenty de-

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grees below, eighteen inchesof solid ice will form in this way in twelve hours. For keeping during the summer much depends upon the construction of the ice house, as in other modes of storing ice. For commercial purposes, of course, this method would not be practicable, but for family use and the private dairy there is no difficulty in cleaving off with an ax the daily supply. But where a constant supply of pure cold water is at hand for the house and dairy, I do not go much on ice any way.

As a school of mechanics, the geared windmill and fixtures has not only a direct influence on the farmer and his help, but an indirect, or reflex as well. The person engaged in looking after, and keeping in repair and improving that class of machinery, will naturally have his mind directed and his hand skilled in devising and executing other schemes, to facilitate his work, and interest his attention—and his windmill faithfully performing a large share of his work. His mind and his hands are at leisure, and both being somewhat educated in that line, he can engage in new enterprises of the kind, with comparative freedom and skill, and as the farmer may be supposed to know more of the nature of farm work than any other man, everything else being equal, he may be supposed to be not only qualified to judge of, but invent successful machinery for farm work.

Much of our complex, elaborate, and consequently short-lived and expensive farm machinery, is due to the fact that many of them are invented and constructed by men that know little or nothing of the nature of the work proposed to be done by their invention. I suppose I could get up a machine for making a gold watch that would be as successful as many farm implements invented by novices in farming. Some of my time and attention has been given to simplifying such farm implements, as are unnecessarily elaborate and expensive, and yet indispensable. For example, the whole series of grain drills, seeders and planters, and have succeeded during the season in perfecting a simple, cheap and durable attachment to the plow, that will sow the grain or plant the corn, beans or sorghum, or anything else whilst the ground is being plowed. It will sow or plant at any de-

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sired depth without regard to the depth of the furrow. It will sow grain and grass seed at the same time at unequal depths as required. In planting it can be done in hilts or drills, and any number of kernels desired. Last spring it was attached to a sulky plow, although it had always been a pet theory with me that the way to plow was to hitch a good team on a good plow, and go to plowing. Yet as my neighbors, Gesley Brothers, and Thompson & Sons, and others, are furnishing sulky plows that they claim to be just the thing for old men and cripples, I could not withstand the temptation to ride too. So I plowed the ground, sowed the grain — seeding thirty acres at the same time to timothy — and planted the corn at the rate of three acres per day with three horses, everything else being equal, it was as good a crop as any in the neighborhood.

Reference was made to thrashing hay. It was found that loose hay was slow to feed and unpleasant to handle in thrashing. This together with the fact that my haying implements were exceedingly limited, suggested a new scheme for haying.

The grass was cut with a "Plano" harvester and binder at the rate of 10 to 12 acres per day, and one good hand put it into shock and capped it. Being thus protected from the weather it remained in the field 'till the rest of the harvest was secured, and being in bundles it was as comfortably handled in thrashing as oats, and being freed from dust in thrashing it is the sweetest and cleanest hay I ever fed my stock. The yield of seed is fully as large, and the quality better than if left standing until dead ripe, especially in the grass-hopper season. The difference between fifty dollars worth of grass seed to sell, and fifty dollars worth of grass seed to buy is one hundred dollars.

An improved method of handling corn shocks was also hit upon, facilitating, and lightening the work fifty per cent.

Several other labor saving devices have been tried, some with marked success, some with indifferent success, and some worthless.

To the farmer of liberal bank account this may look like

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attention to trifles, much ado about nothing; but to the farmer of limited means it is important. The economy of covering our farms with mortgages for costly machines of all kinds, used two or three days in the year, so indifferently housed the rest of the year that they are soon reduced to rust and rotten wood is fast exploding. I make no pretensions as an inventor in a technical sense, but having some skill and strong inclination to whittle some other man's machine up to my ideas of utility, and down within reach of my purse, I propose to prosecute the study a little farther. The simplifying of our elaborate farm implements opens up an extensive field for the inventor, and we farmers are in fault if we do not lend a helping hand, at least by way of encouragement. What other industry could be kept out of bankruptcy any length of time run at such a fearful waste? Filling their factories with costly machinery to be used a few days in the year, and stored in a leaky shed or under the eaves the rest of the time? More for simplicity, economy and efficiency, less for glitter and gold-leaf and polish, and — an assignment.

It seems of late more and more the study of geared windmill manufacturers, to adapt them to the capacity of unskilled and careless men. Their aim is, it together with the machinery attached, on leaving the shop shall be so complete, strong, and perfectly adjusted, that though they may fall into rude and incompetent hands there is not much danger of injury to either machinery or operator. It is noticeably so with the "wonder" grinder, its efficiency depends wholly upon its parts being nicely adjusted, and firmly secured in place, that it cannot be set up wrong. And now, any man of fair prudence, one that may be safely trusted with a span of horses and harvester and binder, is competent to manage my entire outfit, and its general use will tend to develop more of that kind of farm help.

Of course whoever undertakes to prosecute this kind of an enterprise will find plenty of work for both head and hand; but so long as he finds it both profitable and diverting, he can well afford to forego any little inconvenience connected with it, he will find it a perpetual pastime, and his

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days a perpetual holiday. Work, whether it be of head or hand that is engaged in cheerfully, and with zest is not labor; but work performed in any other spirit, however soft and light it may be to brain or brawn, is drudgery. Wherever you find a man that has fallen out with work, you will find a drudge or a tramp, hence too we find drudges in every profession, in every calling, in law, in medicine, in divinity, in the school-house, in the store house, in the shop, in the office, in the bank, and I am sorry to say, on the farm. Why this state of things exists I will not pretend to say, nor to give the philosophy, our convenient scape-goat of anti-bellum days, slavery, being abolished by the emancipation proclamation, we will have to hunt another reason, and I shall be pardoned for gently hinting that mankind is born lazy, that, were it not for an outside pressure there would be but little work done of any kind. That the schools, and especially the schools of America, and notably of our part of America, have for years catered to this fact, continually urging as the chief inducement to their alumni a soft place; so much so that at least one, if not two entire learned professionals will not work, cannot be made to work, will starve first, under the plea of that lazy man's dodge, *brain work.* Some notable exceptions, and as a rule the medical profession may be excepted altogether. The young man that enters on a preparation for the practice of medicine, fully counting the cost, knowing that success means the severest mental tension as well as physical endurance, *is a hero.* To gird up the loins for a life tussle with summer's heat, and winter's cold, at every and all hours of the day and night, constantly breathing the pestilential air of disease and death,— *that is heroism.*

But the general remarks hold good, and hence it is that when this class of mere brain workers fail to secure popular favor, or are elbowed off the track, or are jostled out of their place by an oncoming hungry and lazy horde, they are as helpless as babies; and as a last resort the country is flooded with all sorts of agents — book, life insurance, lightning rod, patent rights and patent medicines, and hence too, it is that the average college commencement, formerly and legit-

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imately an intellectual feast, has come to compete more and more with the county fair, and hippodrome circus in its exhibit of rough sports. With unbecoming haste the class examinations and the rhetorical contests, and even the "Ben Gorham high cockalorum cooper dong" of the honored president, on distributing the diplomas is hurriedly disposed of, and we, doting fathers and anxious mothers, are marched forth to the campus or gymnasium to witness in wonder and awe the chief attraction — our darling boys in tights, hopping, skipping, jumping and swinging clubs. Well, all this may be legitimate and proper enough in the estimation of that class of young men whose highest idea of work admissible, is croquet and lawn tennis, whose loftiest ambition in life is to chase a greased pig, or climb a greased pole, and whose brightest dream of the future is of a gay morning gown and embroidered slippers. But a brighter day is dawning, a healthier public sentiment is developing. The fact that many of the best scholars and professors of our seats of learning, our best business men, artists, artisans and mechanics, best lawyers, doctors and preachers, and best farmers as well, answer to names of foreign accent, is significent. Massachusetts has taken the initiative, all honor to Massachusetts! Old Yale has taken the lead, all honor to Yale! Industrial education in the schools of New England is beginning to receive the attention that it has received in continental Europe for half a century. It is on its march westward. I hope to live to see the day when the curriculum of our schools, the college of letters as well, is so amended, that the gymnasium will give place to the machine shop, and the boat club, and the ball club, and half a score of other clubs, will be superseded by the mechanic's bench and the experimental farm. True, so radical a change may empty our schools of a large per cent of the present occupants, as effectually as if struck by a cyclone, yet a full compensation will follow for their places will be quickly filled by a class of young men ready and anxious to qualify for the actualities of real life, and when we remember that adulterated food and bad cooking is the cause of more misery, disease and death in America, to-day, than war, pestilence and famine, and alcohol com-

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bined, these criticisms apply with as much force to Vassar as to Harvard, to Rockford Seminary as to Beloit College.

We are not all radical. For one I am constitutionally conservative. We do not all pronounce every change an improvement. We may be shy of inovation, we may not all subscribe to the new psycollogy that teaches that the colors of the rainbow are all in the eye of the beholder. That the fragrance of the rose is all in the nose of the smeller, that sweet and sour is all in the palate of the taster. We may not all be captivated by that movement in social reform that would relegate woman to the plow, the ax and the mattock and the plane and the rostrum; and man to the kitchen, the nursery, and the milliner's shop. Nor yet to the new theology that teaches that John was clothed in scarlet and fine linen, and had a silken girdle about his loins, a satin cravat around his neck, and his meat was strawberries and cream. Yet conservative though we be, and with critical eye scan closely all the so called advance thought in science, in social life, in morals, in religion. If we would keep abreast of the advancing column of real progress, when experience utters the command, forward march! We had better forward march.

Early cosmologies represented the earth as a plane resting on the back of a tortoise. Later it was a sphere borne on the shoulder of the giant Atlas. But now it is balanced on the strong right hands of her millions of working men.

When the earth was new man drew his sustenance, and satisfied his simple wants from the spontaneous productions of nature, from the field, the forest, and the lake. Further on in its history man yielded willing obedience, acknowleged his dependence, and looked for protection and support to the semi-gods and heroes of those far off times—for there were giants in those days. But in the later days, when modern civilization has multiplied and refined human wants a thousand fold, mankind as a unit has risen with the emergency, and the earth with its multiform enterprises, its gigantic undertakings, calls loudly for the best energies of every man, and all honor to him that responds cheerfully to the summons, and woe to the sluggard that is content to

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simply exist on the patrimony of his uncles and his cousins and his aunts, a drone in this great hive of industry, ticketed for the land of forgetfulness to rot in oblivion.

Young man — and what I say to you I say also to the best girl by your side — there never was a period in the history of this round earth when true men and women were at a higher premium than to-day, or when snides and tramps were at a greater discount. If you feel therefore any prompting or ambition to act a noble part shoulder to shoulder with your brethren, that you may be honored and respected by the great and good in your life, and gratefully remembered as a benefactor of the race when you are dead, *then fall into line a forward march.*

AFTERNOON SESSION.

Mr. Hinton — I would like to make one suggestion about country roads. Thirty years ago it was suggested in the city of Milwaukee that they should locate their house of correction at the large stone quarry there, that they should apply to the legislature for the laying out of three roads one hundred feet wide, one of them running west of north, one of them running about west, pointing to Waukesha county, and the other one running west of south, pointing towards Racine. I dare say you are all aware that Racine lies somewhat farther east into the lake than Milwaukee does, the object being that the convict labor might be employed in preparing stone for these highways, and not be as it is now, where murderers, man-slayers and rapists, and every form of human iniquity is put into the building and becomes the great competitor of honest labor outside. In that way it would not interfere with it. If I remember rightly, two years ago the legislature was asked for a $30,000 appropriation for the state's prison. At the same time the labor of those men was let for forty-five cents a day. I know from careful research and observation that there are men working for forty-five or fifty cents a day now, skilled artisans in our state's prisons, whose labor is worth, and would obtain from $2.75 to $3.00 per day. I know of two instances in large fac-

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tories in Milwaukee where a man working between two men, working of course as all do, to support their families, committed a heinous offense. He goes to Waupun, or is sent there (they never go willingly), and to-day is working for fifty cents a day, and doing as much work for that amount, and sometimes it may be more, and the proceeds of his labor goes to the benefit of a firm of contractors living in a foreign state. Now, if some member of our legislature could devise a plan by which this criminal class could be made to work to help make our highways, or to make them, and prevent them from being the competitors of honest labor, as they are in the state's prison, it seems to me that a great good would be achieved.

Mr. Roberts — I ask leave to bring to the attention of the convention the matter of a law for the suppression of Canada thistles and other noxious weeds. This is a bill that I would like to have brought before the legislature. There is quite a serious evil to our agricultural interests in the matter of Canada thistles and other noxious weeds, and I have been talking to quite a number of my fellow farmers about this, and I find that the present law on this subject is not enforced. The law seems to be of but little use. In Kenosha county, where I live, there is probably nine tenths of the farmers that are afflicted more or less with Canada thistles and are fighting to prevent their spread. I fight them every year on my farm. I find three or four, or sometimes five or six new patches of thistles every year. The seed is carried from a farm where they do not fight them. They make no effort to destroy them or keep the weeds down, or keep them from spreading. I have been talking here with a good many of my fellow farmers, and they think that there should be a law passed by the legislature that would be effective, and that could be and would be enforced. I feel that the trouble with our present law is, that it is not the duty of any particular person to enforce the law. We have talked the question up in our farmer's club, in the town where I live, and about a year ago we said we would unite together to enforce this law, but we never have done anything, and, as I said before, I have consulted with quite a

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number of farmers here, and they agree that there should be a new law, and that that law should be made effective in some way. So I have gone to work and drafted a bill, and my object in presenting it here was to get the endorsement of the farmers that are here, and then that a bill should be placed in the hands of one of our legislators here, and be presented to the legislature for action, and see if we can get a law that will put an end to the spread of Canada thistles. It is a very serious damage to our interests. It is a very serious thing to have our farms overrun with Canada thistles. The first section of this bill is in the same words precisely as the law that is now on the statute book. I have never known of a case where the law was enforced.

The Kenosha and Rockford railroad runs right through my farm, and it has been over twenty years since the road went through there, and there have been Canada thistles ever since the road was put there, and I spend days every summer in cutting thistles down on the railroad land that I have no control over. I do not depend upon the section boss, for fear of their spreading on my farm. I go every year and cut them myself on the railroad lands.

I wanted to get the sense of the farmers here that are afflicted with this evil.

A Member—I would like to inquire the best method of getting rid of Canada thistles.

Mr. Roberts—The best way I have found is to cut them off repeatedly. I have killed out dozens of patches on my farm by keeping them cut off. I take a sharp hoe along with me, or, when I have not a hoe with me and come across a thistle, I cut it off with a jack-knife, right at the top of the ground. I never disturb it in the ground. I have had them get into my corn field only once. Three or four years ago we were reaping oats and we came across a patch. I was very much surprised to see them. They were in blossom and seed. We stopped the team and cut every one carefully with a jack-knife, and I took them right up carefully to the stove and burned them just as quick as I could, and after the reaper had passed over I had my hired man take a spade, and he dug out every little bit of root he could

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find, and we burned those, and the next spring I went myself and dug the ground over again, and found some little roots that were starting, but that was the last of that patch. I have managed in this way to keep them down. There are nine farmers out of ten in my neighborhood that are fighting them, but there is one or two that pay no attention to them, and we have no law that has ever been enforced in that respect because it is made no man's duty to enforce the law.

Secretary Babbitt — They put their life work all in two years by covering the thistles about a foot and a half deep with straw and letting it rot out. That is one way. You can dig away with your jack-knife all your life and not kill the thistles.

(The further consideration of this subject was postponed until the papers on the programme should be read.)

Discussion on paper read by Mrs. A. A. Arnold. (See Horticultural Report.)

Mrs. Severance, of Milwaukee — *Ladies and Gentlemen:* I do not rise to criticise, but rather to endorse and perhaps add a little. I was pleased with one point particularly that was emphasized in the paper, and that was the development of individual character, and that the idea that has been advanced by some individuals, and acted upon by many more, that the end justified any kind of means, was not the correct one. I believe in doing right for love of right every time and trust for the consequences, and I know that if you do act rightly the consequences will be right consequences every time. Now, in reference to our girls and their education. I believe that a false idea is instilled into the minds of our girls from early childhood, and that is that they are different from their brothers in this respect, that the young men are expected when they reach manhood to make a place for themselves in the world; that it would be considered disgraceful for a young man to be dependent upon his parents for support. It should, in my opinion, be just as strongly instilled into the minds of the girls that they should be self-sustaining; that it is disgraceful for a woman not to be able to support herself. (Applause.)

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And when this idea obtains in the minds of girls they will not be dependent upon marriage, as they are now, and when men marry women it will be because of love and for companionship, and not, as is too often the case at the present time, because the girl wants a home, and her father is getting tired of furnishing her one, and she is getting tired of depending upon him.

This will remedy a great many of the defects in our homes, when girls are self supporting and marry because of love and not for a home. Another thing, when society reaches the condition that it should, it seems to me our homes will be partnerships. The father will not be the one that will hold and control the money always, as now. It strikes me that when a man and woman come together as husband and wife it should at least have the dignity of a business partnership, and the funds should belong just as much to the wife and the mother as to the husband and father. They should not be dependent upon the husband for that fund. It should be accessible to them the same as in any other partnership, and when that condition is attained it will do away with a certain other condition that comes as a consequence, and I want to refer to it right here because I have known it demonstrated a great deal in practical life, and it is a delicate point, but one that is of importance in my opinion. We find everywhere in society to-day, with very few exceptions, that if a wife wants any money to use she has to go and ask her husband for it. It is not at her command as it is at his. I know a great many women that have enough independence of nature so that it is a great humiliation for them to have to do this, and in fact I do not know of a woman that is worthy the name of woman that does not feel it is an indignity put upon her when she does have to do it. She feels, as anybody ought to feel, that with her part in forming the home and with the responsibilities that rest upon her she should have equal privileges in this matter. How many women there are that take all manner of means to procure pocket money without humiliating themselves by going and asking for it as a menial dependent.

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Now let me cite a case to illustrate the effects of this. I was lecturing at one time in the state of Illinois. I was an invited guest of a family which was composed of the husband, wife and one child, a son about fourteen years old. When I retired for the night the lady said to me, 'If you have any jewelry, put it one side, or lock the door, for I regret to say our son steals anything he can lay his hands on.' I went to bed and thought of that. There was the father and mother, honest people, and there was the boy, a born thief. In the morning I enquired of the mother if she could not explain some reason why this should be so. She said, 'I can.' She was a more than ordinarily intelligent woman. She says, 'Before that child was born it was a great humiliation to me to have to go and ask my husband for money every time I had to spend it, and I used to look through his pockets to find the money that I needed to spend, without knowing the consequences, and in that way I branded my unborn child.' How many children are born in this world thieves by reason of making the mothers of our children dependent upon the men for the money they use. This is something worth remembering. Now, men that listen to me, see to it that they are not kept in that dependent condition, but that they are equal everywhere in the world, and that in the family life each should share the results of the labors of both. The money should be equally accessible to the wife, if not more than the husband, and they should be equal partners in their financial as well as in all other respects.

THE MOST PROFITABLE STOCK ON THE FARM.

MRS. J. A. CLARK, Waterloo.

I have been asked to tell what I know as to the most profitable stock to raise on the farm. I do not think it would be becoming in me to try to give points to these gentlemen present as to hogs, or cattle, or sheep, or horses. What they do not know as to these I fear I could not tell them. But there is one kind of stock that we do raise on the farm that I consider myself competent to talk of.

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If Cornelia could say — leading out her sons — "There are my jewels," so may we, farmers' wives, bring out our children and remark, "This is our stock." Having raised it ourselves it is but natural we should consider it the best stock on the farm and be also anxious to bring it to its most perfect development. We often read that it is our duty and for our interests as farmers, to give a higher culture to our crops. I wish here to put in my plea for the highest culture for our most important crop — our boy and girl crop.

I have lately been reading the Wisconsin Agricultural Report for 1884. I find it very entertaining and at times exciting reading. I have read carefully all that was said as to separating the agricultural college from the university, and it has seemed to me that one great point has been missed in the discussion.

Instead of farmers devoting all their endeavors to establish a technical and separate school for the education of our children, I would insist that we improve the advantages we now possess and send them to the university.

The university does not make lawyers, or doctors, or clergymen of students. It gives them a general and liberal education and sends them out scholars and gentlemen.

What, may I ask, have the farmers done that they should not avail themselves of these advantages? We certainly pay our share of the taxes, and shall we permit other classes to reap all the benefit?

Again, is there any need of a liberal education among the farmers as a class. It seems to me that there is. Is it not generally agreed that the brightest farmer boys are leaving that business for more attractive professions. Why do they leave it? It is not because they object to the manual labor on the farm, they are bred and accustomed to that and do not mind it, but they do object to the want of intellectual activity, refinement and culture which they expect to find in other professions.

You are all familiar with the Darwinian theory. Does not the danger occur to you, that if we select one of our best for other occupations and breed from the inferior class which remain, we are sure in the end to lose our grade among in-

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tellectual people. It would be very sad to find so large a class as our farmers retrograding to our Simian ancestry.

The learned professions are notoriously uncertain in their remarks, let the educated farmer's boy find educated men and equals among the farmers and nothing will induce him to leave that business. There is no lack of intelligence among the farmers as a class now. They take a dozen papers, they know what is going on in the world, you cannot overreach them in a trade, they understand their business thoroughly, but from a want of culture they are shut out from an enjoyment of a higher literature. When I see how intelligent the majority of our farmers are, I think it is a shame that their natural intelligence has not been supplemented by a better education. I wish and hope that our next generation may have the advantages that have been denied this one. We see now in every legislature from 40 to 50 farmers. Are these the most important men there? It has not been so heretofore. They have as a rule sat mute and inglorious while other men with no more natural ability but with a broader and better education have taken the lead. Let us have fifty farmers, graduates of our university in our legislature, and you will see better things. If, then, the farmer needs this higher education, will the advantages to be derived from it pay the expense of obtaining it. A neighbor of mine said in regard to one who was rebuilding his house: 'He is a fool to lay out so much money on his house, his farm won't sell a cent better for all that outlay." His idea of a home and a farm being what it would sell for. So I might expect the same man to say, "A man is a fool to send his boy to the university if he intends him for a farmer. He won't be able to pitch any more hay or cultivate any more corn than if he had stayed at home." I think the man wrong in both his statements. In the one case the house pays the owner a daily dividend in its additional beauty and convenience; in the other, the boy, whether he can work harder or not, whether it brings him in any money or not, has the constant indwelling satisfaction of knowing that he is better informed than he otherwise would have been; that he has a greater capacity for enjoying whatever he may

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earn; that his mind is enlarged and that this additional culture which he now has will live in his children and his children's children.

Has there ever yet been found a man who regretted that he had a college education? The are no men in the world to whom a liberal education is at once so much of a necessity and a luxury as to farmers. They need it to enable them to take the place which belongs to them among the people. A farmer with one hundred and sixty or two hundred acres of land, and a few thousands at interest—and we have many such in every town—is a king among men. If his intellectual advantages were commensurate with his other surroundings he would be totally independent of everybody. What other class is so?

Col. Vilas once said: "There is no lord or master above him. There is no rank or grade of social life which is his superior. I speak it with the full meaning of the words employed, and affirm again that beyond the farmer there is no business, no avocation, no grade of social life and no higher class of men in the states of America." Shall men holding this exalted position limit their sons and daughters to a fourth class education? To the farmer, of all men, education is a luxury, even when plowing, sowing or reaping his mind is at rest and he is at leisure to think over what he has learned and read.

In the long winter evening his opportunities for enjoyment are doubled and trebled. In a community of like cultivated farmers nearly every intellectual advantage could be enjoyed that could be obtained in the city.

It is with such a people as this I wish my children to dwell. I want my boy to be a farmer, and I want my girl if she marries, to marry a farmer, but I want her to marry an educated man. You may ask can we afford to give our children a liberal education. In no state in the Union are advantages for a thorough education cheaper than our University offers. Tuition is given as a saving of one hundred to one hundred and fifty dollars a year over eastern colleges.

Boys whom I know tell me that it cost them $200 a year,

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$600 a course. A smart boy ought to earn one half that amount in his vacations.

I can ride out from my home and in ten miles I will see forty $1,000 barns. They are good to see; but if a farmer can afford a thousand dollar barn, he can afford to send his boy through college, and I look forward to the time when we can see a like number of college graduate farmers in a like ride, and I would like to see them classical scholars.

Farmers may say give me an agricultural college for farmers' sons. But why — boys who intend to be lawyers and doctors go to the university first, send your boys there and let them get first a good general education.

I doubt if agriculture is a science, it has not been reduced to a system and there is but little that can be taught in an agricultural college that a boy could not learn with a good farmer at home. I feel sure there is not a farmer in this room who thinks an agricultural college could teach him anything about running his farm. Let the boys get their general information in a regular college course and then they are fitted to take up any special agricultural studies that they may think will help them. We are by no means sure now of what studies an agricultural course should consist. I remember seeing in a Dartmouth agricultural college catalogue, "Paley's Natural Theology" as one of their studies. When we have a body of university graduates as farmers then they will know what they need of agricultural information and the curriculum of the agricultural college will be fixed as it should be. We do not wish to make our children professors in such an institution, we wish to make them educated farmers—gentlemen of taste, men of learning, as intelligent in general facts as men of other professions.

Just as I write this there comes to me a circular addressed to the farmers of Wisconsin—signed by five well-known farmers in the state, asking that every endeavor be made to found a new college expressly for farmers' sons, taking them from district schools and giving them a two years course. It seems to me that these representative farmers show by their action that they have a poor opinion of themselves, their sons, and their calling. Do they mean by this

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that a boy knows enough to enter their college if he has been to a district school, while for any other institution of a like name he must graduate at a high school? Do they mean that a two years course with this fit, will teach him enough of the business *he* professes to follow, while for any other class of people, four years are required? That one half rations of knowledge are good enough for *him* and that it is best to make the word agricultural college, a by-word of disgrace by attaching it to such an institution. I remember when I first came West, I chanced to spend a day at Fulton, Illinois. There was a time when people predicted that Chicago would not amount to much, it was so near Fulton. In these hopes Fulton people had a mill, a large hotel, and when the hotel business failed they turned it into a college. Interested in such institutions I visited it. Entering a room marked senior recitation room I noticed a maze of figures on the black-board. Somewhat deficient in the higher mathematics myself, I was wondering if I could understand what interesting problem these seniors were working out, when I was relieved to find it was the multiplication table that was before me.

Is it a college of this kind where the seniors study multiplication that you propose to give us?

If you could only add the library once owned by an Iowa college, your institution would be complete. I met the President and he was bragging of his college library, "over one thousand volumes" and on my mentioning the high price of books in these war times, he said, his were all donated from the private libraries of the clergymen of this denomination. "We have"—said he with pride "thirty seven copies of Josephus."

Is it possible to suppose that these representative and intelligent farmers would take a pure blood, expensive Shorthorn or Hereford or Jersey and feed it with one half rations of poor fodder. Yet is not this exactly what they propose to do with the best stock we raise on our farm. Like the cattle in the agricultural fair mentioned in last year reports, this proposed college is "ring-streaked and speckled." For myself I considered nothing in the way of learning too good

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for my children or for the children of any farmer in this state, and I wish to protest against making a parish caste of them by sending them to such an institution.

We are fitting our children for a great future.

Statisticians tell us that in thirty years, that is within the life-time of many of us, we will have in this country a population of 100 millions, that within the life-time of children born to us it will grow to 200 millions. Has it occurred to any one to forecast what will be the condition and social position of the man who owns the land in those days? The holder of 160 acres will be a prince — 150 people will be dependent on him for support. Our own country will then consume our own products, and the farmer great and glorious will hold the first place in the land.

Yet, these farmers are to be our children or at the farthest our grandchildren — and they will hold their parents culpable if they do not give them an education suitable for the position they are to fill.

It has never yet been the custom for farmers to give their children a literal education to fit them for farmers. If a boy was educated it was to make him a lawyer, doctor or minister. Now this it what I want, I want the boys educated for farmers. I want it instilled into their mind from the beginning that the business of farming is the best business they can follow, that it requires the best and most liberal education that he can obtain, that for one of them to take his place among the coming generation of farmers he must know all that he can learn, he must delve in the literary treasures of the ancients; he must be skilled in all the modern sciences; he must be versed in the general run of literature; he must have an intelligent understanding of all the questions that are now agitating mankind.

He must be a student and before he can be a farmer he must graduate himself a thoroughly intelligent man.

When this is done, our boy will stand forth the highest example of all that is both fortunate in situation and excellent in talent — *the best stock we can raise on the farm* — a farmer, a gentleman and a scholar.

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Mr. Chapin, of Waukesha — I wish to say just one word upon one point. You farmers have come here with the assumption that everybody that lives in the city is educated, and that farmers do not know anything. Now, I want to take the other side of the question. There is more intelligence to-day among the farmers than any other class of people in Wisconsin. Why is it then that the farmers come up here and say "we do not know anything; we want a college so that we may know something; everybody that is not a farmer is getting ahead of us in knowledge?" It is all nonsense. Take it in the city of Madison for instance. There is not one voter in town to-day that could tell who the lieutenant governor of Wisconsin is. You can find ten times the knowledge in the country among the farmers than you can find in the city, in all branches of industry that are carried on, among men of all occupations. You talk about wanting an agricultural college. I can see only one need of an agricultural college, and that is not to educate the farmers' sons. They have got grand, good colleges on every section of land in the state, but you want an agricultural college to educate the sons of lawyers, ministers, bankers and merchants that are residing in the city and are good for nothing else. (Laughter and applause.) Mr. President, the tramp question has been a great question before this state for four or five years, as to how it should be solved. Get an agricultural college and have for one of its rules that none shall go into it except the sons of lawyers, and merchants, and bankers and preachers, and then you will educate them so that they will be fit to get a living on a farm, and you will solve the tramp question. (Laughter and Applause.)

Now, Mr. President, I know what I am talking about, and I say that the system you have got for farmers sons is a tip top thing to-day. You have got a college here, and I had the pleasure of attending it awhile, and we had two and one half months vacation every summer, and if you want to educate your boys to be good farmers send them to Walworth county, where I went each summer during my vacation and hired out on a farm by the month, and if you do not get good agricultural training at twenty dollars a month

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for two and a half months, I cannot give you any advice where to get it. And Mr. President, if this bill passes the legislature, I earnestly hope there will be a provision in it that no farmers' son shall be allowed to attend it, but only the other class I have referred to. There is no earthly use of a college for anyone else. (Laughter and applause.)

Mr. Hoxie — I want to say that I have attended these meetings regularly for the last twelve or fifteen years, when there was only a handful of us in the room below. I have watched these meetings and the progress of agriculture in this state. I have listened to all the talk and the arguments and read all that has been said upon this question of an agricultural college, and I am very sorry to hear the opinion expressed by anyone that that college is only for the farmers' sons, because it only makes provision for a two years' course, just as though by that two years' course they were forever excluded from anything else. That is all wrong that any such opinion should prevail. Mr. Chapin says that these farmers are intelligent men, and they are. They have been educated in brains and hands both together. You know there are certain duties to be performed that they cannot get at all of these agricultural colleges, not in our state, at least, but there are states where they can get them. Boys can take a two years' course which will qualify them to be much better farmers than they are now, much better qualified on certain matters. They have sense enough and brain enough and brawn enough.

It has been remarked here to prove this that the farmers that have assembled here at these conventions outrank those that occupy these seats when we are gone, and this year I think we have a large proportion of farmers in the state legislature, which only shows what we have been doing. These remarks are made because I wish to disabuse the public mind of any impression that we who are advocating this college are only making provision for the farmers' boys, and only for a two years' course. That is not so. We want this two years' course, because there are certain things that they can learn in the two years' course, and we want to give

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them the privilege of this in our state. We will not exclude the class that brother Chapin alludes to.

Gov. Rusk—I did not desire to be heard at this time, but I desire to make some statement before this meeting closes, in regard to the interests of agriculture. I was pleased when our state carried off the premium at New Orleans. I received a telegram from Mr. Curtis, the secretary of our Dairymen's Association, announcing that we had carried off two thirds of all the premiums at that fair, and I wanted to say that it did me good to know that Wisconsin could go into an exhibition where the whole world was invited and waltz off with the best butter and cheese. It is true that we have had a struggle to get an exhibition down there. It was hard to get our people to undertake it. There were no appropriations. Congress made an appropriation for the United States to be represented there, and appropriated $5,000 to each state, and that was all we had to commence with, but when I received that dispatch, I said, no odds what it costs, Wisconsin had made one half a million dollars the minute that was announced. It is worth that to the farming community, to the people of the state, to be able to claim the victory over all, old and new states, and I could hardly let this occasion pass without stating these facts as they are.

Now I want to say to the farmers that I think farming is a science, and it depends upon you farmers, the science of feeding all the people. The lawyer, the doctor, and everybody, have to depend upon you for their bread and butter. If there is no science in making the bread and butter, then you had better stop and see what will become of the other part of the race. I say, let us do what we can to elevate the science of farming, and let us use the necessary expenses to carry it on. It is not for me to say what you should do, it is for the farmers to say what they want, and the powers that be will have to give it. You have two thirds of the votes in this state; you make the legislature; you make the state officers, and whatever you demand of them they cannot refuse. I know the governor will not refuse what you demand; he knows better. (Laughter and applause.) I am

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a farmer myself. In early days I got ten dollars a month, and I had to get my education in that way. I am sorry that I did not have more of it; I am sorry that I could not have had the benefits of a two years' course in an agricultural college. If I had, I would have probably been a better farmer than I have been; I know I would. I was reminded to-day of a thing that occurred when I was with a party that went across the country for pleasure. Governors of the states and a great many wealthy men from Europe and professors of universities were invited to take a trip across the continent, and we of course accepted a free ride and a free lunch, and on our way at every station the farmers had their products to show us what the country produced, and there was one continuous fair at every place where we stopped from the time we started until we landed.

When we got into the wheat fields of Dakota they had their threshing machines up on the side of the track and were running them, so they could show us what they could thresh, and how they did it with steam and machinery. It was there that William Henry Smith, chief of the telegraph corps, remarked that there was not a man in that party that could run a threshing machine, and I told him I did not believe that, and I shoved a fellow off that was running the machine, and got on the platform and run a load through, and when I came down I went to the car of German and English professors that I had got acquainted with on the trip, and they said, "Why Governor, were you educated in this country?" I said, "Yes." "Why, we did not know that they did that in this country. We did not know that they taught mechanics and such things." "Why," I said, "You are very much mistaken. I was not only educated in an institution of that kind, but I was a professor of threshing." And I am not ashamed of it. Now, we have our state boards for controlling the insane, and for the purpose of taking care of paupers and managing them; we have an insurance commissioner, and we have a railroad commissioner; and now let us have somebody or something that will take the head of this great and first interest of our state and manage it and run it. Let us have some law that

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will give power into the hands of the farmers to give them what they desire.

This summer I found that in Illinois their stock was threatened with pleuro pneumonia, and I received a notice from their agricultural department that some of the stock had come into my state, and it was necessary for me to take some steps. I went immediately to hunt some law or to find some way by which we could stop it in this state if it came. I found that we had no law to protect our animals upon the statute books. I immediately called Prof. Henry into council and asked him to go to Illinois and investigate, and he went down there and found that a few heads that were diseased had been sold and had come to Wisconsin. I then had to call for a veterinary surgeon to go with him to examine the diseased animals. I instructed them to purchase the animals at private sale, if they found it necessary, and slaughter them, and ascertain what was the matter, so that they could report. I found that there was no law upon our statute books that would permit us to seize the animals and destroy them, or do anything in the way of quarantine, or to stop the spread of this disease. The state of Massachusetts was in that very condition at one time and it cost her a million and a quarter dollars to stop that disease in that state, simply because they had no law or no way provided. Now I ask you to come up and ask the legislature to pass some law that will protect your property and protect everything upon the farm, so that you may feel yourselves secure. This is a duty that you owe yourselves, and you owe it to the legislature to press it upon them.

I do not know that I would be a proper person to speak upon the subject that has been discussed to-day. I think the women of the house should have supreme control, and I think every farmer should turn over to his wife the control of the house. She is able and competent to run that department. She is the home maker. If I should go home and find a poor dinner I should blame my wife and not myself, because she has power to make a pleasant home and I have not. If we cannot maintain our wives and allow them to run the houses we had better quit. I have said more than I

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desired to-day, and have used more than five minutes, but I hope that the agricultural people of this state will decide just what they want, and I will guarantee that they will get it if they will ask for it unanimously.

Secretary Babbitt — Do you think that a veterinary surgeon or a corps of veterinary surgeons, under the direction of an agricultural board, would be a wise provision to stop the spread of pleuro-pneumonia in this state?

Governor Rusk — I am not here to suggest any law or any prescribed way of doing. The legislature is selected for the purpose of preparing laws for the protection of the people, and I shall be satisfied with anything they may see fit to present to cover this ground. It is not only pleuro-pneumonia that we want to be protected from, it is other diseases; all diseases of animals. There are a great many diseases amongst animals that people become affected with, and the board of health has recommended that a veterinary surgeon should be appointed for the state, and a law passed giving him power to seize and condemn, and destroy property if he sees fit, and in that case I should think that it would be proper to pay what the value of such property was. Such a law should be provided.

Now Mr. Babbitt has risen and asked some question. I anticipate that he thought, because I did not mention the agricultural society in my message, that it was some slight or something that I intended disrespectful to the agricultural society. I want to say that when I came into office I found the agricultural society in debt. Two years ago, in my annual message I requested the legislature to pay their indebtedness, and to put them on their feet again, and give them a new start, and the legislature did it. I know of no reason why I should specially call the attention of the legislature to that society, or to the Northern society, or to any other particular agricultural society. I did speak of the horticultural society because they were making extraordinary efforts to make an exhibition in New Orleans. My object was to call the attention of the legislature to that fact, and ask that this year they make an additional appropriation to them. I did also call their attention to the or-

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ganization known as the dairymen's association of the state, because I am proud that I live in a state that has such an association that is able to carry off the premiums at a world's exhibition.

Mr. Babbitt — In order to show that the Wisconsin State Agricultural Society and the farmers of the state association have no enmity or ill-feeling against its governor, who has done so much in advancing agriculture, I propose that we here unanimously endorse a bill, recommended by the governor, for the appointment of a surgeon or corps of veterinary surgeons to act under the direction of a board of health for the prevention of diseases of domestic animals.

(Motion voted upon and carried unanimously.)

Mr. Hoxie — I rise to a privileged question. We miss in our assembly this week, one who has always been here with her council and her brains and encouragement. I allude to Mrs. Lewis. The state horticultural society, of which Mrs. Lewis was acting as secretary, has since her departure appointed a committee to prepare suitable memorial resolutions which were to be read at this convention. The gentleman who is the chairman of that committee is present in the room and I would like at this stage of the meeting to have those resolutions read. (Mr. Adams read memorial resolutions relating to Mrs. H. M. Lewis.)

EVENING SESSION.

A resolution was offered that it was the sense of the meeting that the legislature should appropriate $15,000 to this society for the purpose of erecting permanent exhibition buildings at Madison.

Mr. Broughton moved the adoption of the resolution.

Mr. Broughton — I would say that all the argument that is needed is to go and look at the buildings themselves, and it ought to satisfy any reasonable man that there ought to be something more done. They ought to be reconstructed and rebuilt, or something of that kind, for they are not fit to be used for that purpose.

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Mr. Williams — I would like to ask if those buildings will be permanently located if that money is appropriated.

Mr. Ford — I will, only state what ladies and gentlemen who are interested in the agricultural society have stated to me. Of course, living here in Madison, I know the situation of the buildings. There are no buildings there of any permanent character. There are extensive and beautiful grounds owned by the state agricultural society, easy and accessible, and in every way adapted to the purposes for which they were devoted, and very valuable grounds, but the buildings are simply temporary structures, small and inconvenient, and the owners of blooded stock and exhibitors who wish to come here do not feel sure that their stock will be safely housed, and that articles of whatever kinds to be exhibited here will be protected. There are no proper conveniences there, and I believe it is wrong for a great society like this, making the exhibits that this society has been making during the last three or four years. That is briefly the statement as made to me, and the committee having the matter under consideration were very unanimous in deciding in their opinion, whatever weight that may have.

President Arnold — I will state that the grounds, some seventy acres, belong to the State Agricultural Society. We have the finest grounds that I know of anywhere in the northwest for holding a fair, everything complete, except we have not good buildings and proper place to exhibit things that people bring to the fair. With this appropriation, by taking down the old buildings we can have very nice arrangements made, and the state of Wisconsin can as well afford to do something in this line as it can to appropriate its money to every other purpose under God's heavens.

Judge Williams, of Walworth — An appropriation of that kind can have but one legitimate meaning — a permanent location of the state fair. That can have just one result, making a local fair of it; that is inevitable in the nature of things. We cannot escape from that conclusion. It is the experience of all societies. It follows as surely as effect follows cause. If we are ready to permanently locate the society in Madison, making a permanent location and a

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Dane county fair of it, all right. That result will follow by that course. It may require, in the minds of many persons, an extensive argument to prove this. This is neither the time nor the place. This is proved all through the state. You have but to study this question in all its bearings in other states. I have hoped that the time might come that a point in the state would be so central in its attractions, geographically so nicely balanced, that no counter societies could be built outside of it to make it a local fair. You anchor the State Agricultural Society here and you antagonize Milwaukee. Mr. President; you know very well what the effect of the location of the state agricultural society in Milwaukee, in Madison, in Janesville, and not in the northern portion of the state, has resulted in. You have estranged that portion of the state. They will antagonize the State Agricultural Society to the extent of their ability. They are proving this by their acts. You leave the State Agricultural Society with all its possessions here but unanchored, and with the assurance that under favorable circumstances it will float to some other locality, and you give other localities a notice that though, they may start to antagonize the society, they are likely to be encroached upon by the State Agricultural Society at any time, and they will avoid that. They will not so far antagonize Milwaukee that they will build up a fair of their own and take the matter in their own hands, as St. Louis has done. This question is an important one, and involves many nice points of consideration. While I am in no mood for arguing it, I antagonize the principle so strongly that I could not do myself justice without making my antagonism apparent.

Secretary Babbitt.—I would like to say that the wise action of this meeting here, as far as we have gone, has proven conclusively that it is impossible under any considerations for us to permanently locate the state fair at Madison or any other point. The life members of the Wisconsin State Agricultural Society, and the presidents of the various county organizations of the state of Wisconsin, are to settle that question, and it is well understood that the time has come when there must be points for education in every depart-

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ment. The state fair, located at Madison, at Racine, at Oshkosh, at Eau Claire, where we tried to go last year, or any other portion of the state, becomes an educating institution to educate the people. It is purely a people's school, and you can understand, gentlemen, although you might appropriate $15,000 to beautify and adorn these beautiful grounds that we have here, that there is no power whatever above the sovereignty of the farmers of the state of Wisconsin, represented as they are by representative men from all portions of the state, and whenever we cannot hold the fair at Madison we can go to any other portion of the state wherever these gentlemen see fit to take the fair, the school of the farmers.

Mr. Hinton — I would like to say a few words as to what my friend Judge Williams has said. After you have spent $15,000 on these grounds suppose you should vote to have the fair twice in Milwaukee, why has not Milwaukee a right to ask the legislature for $15,000 more for good buildings? When my respected friend here speaks about the beauty of these grounds, he knows there is not a man in the United States who has a real fast horse who will put him on these grounds. They could not make the time if they tried to.

Secretary Babbitt — We made 2.07 last year.

Mr. Hinton — If you can find anybody that can go faster than Babbitt in any direction he will beat Maud S. I said openly in Milwaukee, when that respectable committee went around asking funds to take the state fair to Milwaukee, "Gentlemen, you might as well try to do anything else that is impossible; I do not care what you subscribe to it, you cannot get it here." Now I hate these antagonisms in a state; they are injurious to everybody; I ask any gentleman here, if the legislature grants $15,000 to put up buildings here, and three years from now the state fair should go to Milwaukee, why Milwaukee should not ask for $15,000. I know to-day there is an effort in Milwaukee to have such a fair there that will throw your state fair into the shade, unless some of that ill-feeling — be it right or be it wrong — is allayed. I have not tried to foster it. Mischievous men in some communities have sought to impress upon the pub-

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lic the idea that I am hostile to it. There is not a human being on earth that I would do an injury to if I could, certainly not an institution of any kind. But you are treading on dangerous ground.

Secretary Babbitt—Do not carry the idea that there is any ill-feeling existing.

Mr. Hinton—I know there is such an ill-feeling existing. I know it is very general, and I know that what one gentleman said here is positively true. A good many of my years were spent as a newspaper correspondent all over this state, and somehow or other these newspaper men get into the habit of telling the truth and looking into things, just the same as the lawyers do; and they know what they are talking about. I do not say that ill-feeling is right, but you are treading on dangerous ground.

Mr. I. C. Sloan—I desire to say a word in response to the idea of the able and distinguished gentleman from Walworth county, when he said that if the state fair should be located in Madison it would become a local fair, simply a Dane county fair. It seems to me that that is hardly well founded. To my mind this system of moving fairs, making them moveable, giving to the eastern part of the state one year and to the western part of the state another, makes the state fair a local affair. It is a hardship to require the people in the western part of the state to traverse the entire extent of our state over to Milwaukee. It is a hardship for the people in the southern part of the state to traverse the long distance between that section and the northwest, and so of the other portions of the state. To make the state fair what it ought to be—a *state* fair, in which all the enterprising farmers and agriculturists of the state will take an interest, it should have some central and accessible location, accommodating all parts of the state, and it should have some permanent, respectable improvements and buildings to give fair accommodations to the farmers, to the agricultural implements, to the people who come to the fair, and when you select a central location, equal and fair in regard to all the people, and accessible to railroads from all parts of the state, and then give accommodations worthy of such

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a state as Wisconsin, with her population, her resources, her agriculture, her mines, her manufacturing, entering in the race of competition with all the states of this country, is, you will answer the demands of an intelligent community.

If you go to one side of the state you occupy temporary and inconvenient quarters. You call upon the people to strain their charitable and liberal ideas to raise a large sum of money to fit up grounds for temporary purposes. It is hardly the thing to do, when a state has advanced to the position that Wisconsin now occupies, able to provide for the accommodation of her people in these great industrial exhibitions, from which vast benefit, in my judgment, flows through all the towns and every industry through the state. Now it is, I know, an unpopular idea. My friend from Milwaukee says, "you talk about getting the State Agricultural Society located permanently at Madison, and the Milwaukee people won't stand it." If I may be allowed to use a slang phrase, they say, "we will kick if you do it." Ohio has recently purchased, at an expense of $40,000, permanent agricultural grounds at Columbus, inviting the whole people of that great state to come there; and it is coming in this state; it is necessary, it is the part of wisdom, and we may as well meet this question. I tell you men cannot live in a large community, like a state embracing the broad territory of the state of Wisconsin, unless they are willing to sink, for the sake of the general good, these narrow and selfish ideas of locality. It must be done. I therefore think that this appropriation should be cheerfully voted, not only by this convention, but I think the legislature will respond to such a demand and we shall have an agricultural society that every man in the remotest boundary and limits of the state of Wisconsin will take a pride in. (Applause.)

Mr. Hoxie.— I understand the farmers of this state, when they meet, come for mutual intercourse; Madison is the place, of all parts of the state, most convenient and best adapted for that purpose, with its situation, with its railroad facilities, being the general center of business for the whole

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state, as it is, and I believe that it would be on the whole the most convenient to have the agricultural fair established here. Of its own weight it will fall here, and if some improvements in its buildings can be made, I believe it will be for the general advantage of the state. (Applause.)

Mr. Roberts.—I live one hundred miles from Madison, and I am in favor of that appropriation, and I am in favor of locating the state fair here at Madison.

President Arnold.—We cannot permanently locate the fair here. The question is on the adoption of the resolution to make an appropriation.

The resolution was then adopted.

Mr. Ford of the committee of resolutions presented a resolution expressing appreciation of the services of Prof. Wylie. Adopted.

MAKING MONEY.

By HON. H. C. ADAMS, of Madison.

In one of his essays Lord Bacon tells us to "seek not proud riches, but such as thou mayest get justly, use soberly, distribute cheerfully and leave contentedly." The great philosopher who led the thought of his age, never uttered a wiser sentiment. It can be specially appreciated by the men who make their money from farms, for great financial results are impossible from the average farm. The man who really desires and expects great results never wastes his time upon agriculture. No farmer has ever fed his horses gilded oats in marble stables. The boy who aims to be a millionaire may deal in wheat, but he allows somebody else to raise it; he may corner corn but he has never been found cornered in a corn field, and he never will be. The morbidly accumulative faculty carries its possessor to the great centers of business life. The human blood sucker fastens itself upon a great artery rather than upon a simple capillary tube. The average farmer can expect to reach a comfortable financial condition, but he can no more become rich in the modern sense of that term, than he can reach heaven by being elected to the legislature. I look with great respect upon

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money. I wish that I could look upon it oftener and see more of it. It should never be despised. It has been said that some men look upon it with contempt. I have never found any specimens of that class and I doubt the existence of any since the money changers were driven from the temple. Men like to be comfortable. Money buys comforts. The supposed intimate connection between money and misery is one of the popular delusions of the day. There is more charity, more love, more inspiration, more life, more power in wealth than in poverty. All these adorn and make satisfactory human life. In only one respect has the poor man an advantage over the rich one—he is not so likely to have dyspepsia. Love of money for the things it enables us to do and have is legitimate. The miser is a human outlaw. With him we have nothing to do. There is but one grade below him, and that is represented by the lazy pirate who claims that the world owes him a living. The one great absorbing question which holds the constant attention of men all over the civilized world is the money question. It affects the policies of governments and warps the creeds and practices of churches. In America the everlasting race after the "almighty dollar" has become proverbial. The natural proper and healthy, desire for legitimate gain is often swallowed up in a wild frenzy for wealth at whatever cost. All classes are affected by this latter spirit to a greater or less extent. As Matthews says in one of his essays: "The clergyman finds in the offer of a large salary, a call from on high to enter a larger and more sanctified field of labor. The craze for sudden wealth is a sort of contagious and popular insanity, and the farmers have not wholly escaped. Thousands upon thousands of them lay their financial offerings upon the altars of the grain and stock gamblers of Chicago and New York, and the smoke from their idiotic sacrifice very often rises over impoverished families, broken ambitions and blasted characters. Numberless farms have been sunk in the silver mines of Colorado and Nevada. The number of farmers who have bitten off more than they could chew in the patent-right business is astonishingly large. Some of them have

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hung themselves with patent clothes lines, while others have washed away their wealth with patent clothes washers, churned it out of existence with patent churns or put it into the fire of some wonderful patent concern that was warranted to dig potatoes, hoe corn, sow onions seed, pick cherries, make a hen set and spank the baby. The average farmer who expects to make money should stick to his business. Let somebody else run the groceries. A farmer with a store is in a similar condition to the storekeeper who has a farm. In the first case the farm supports the store and in the second the store supports the farm. The farmer who expects to make much money should keep out of an active political life. He can perform the ordinary duties of citizenship without any financial strain but a regular political career is a perpetual lien upon his energies and an unredeemable mortgage upon his cash. A political career is proper enough and honorable enough and all that but it is not profitable as far as money is concerned. A farmer who wishes to get as much money as possible from his farm must know three things — himself, his farm and the markets. A farmer should study and study thoroughly his own make-up — his tastes, his weak points, his strong points, his ambition and his mental and physical habits. The man with a taste for Jersey stock has no business to fool away his time on short horns and *vice versa*. The lover of vines and plants and shrubs is not likely to get rich growing hay or feeding hogs; the man who makes a failure raising wheat on a section of land in Dakota may very likely make a decided success on a ten acre garden near the great markets if his tastes run in that direction. It is a great waste of nervous energy for people to do those things which are distasteful to them.

Work under such circumstances is mechanical and lifeless. The unknown depths and resources that lie in every man exist unstirred and undeveloped when he twists his life to an unnatural bent and endeavors to act the part which the Almighty has assigned to some other man. "What is one man's meat is another's poison," is as true in business as in dietetics. The farmer in a law office and the lawyer on a

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farm, the first running a plow through the decisions of the courts, and the latter barring out weeds by the statute of limitations, are no more absurd and profitless specimens of humanity than a natural-born stock-breeder working a market-garden in New Jersey, or a horticulturist to the manor born who is found herding cattle in Texas. There is hardly a farm in this country which contains ten acres or upwards that does not possess a productive capacity, if properly managed, sufficient to support an average family in comfortable circumstances. The farmers will be richer when they invest more thought in this business and less labor, when they get out of the old ruts of custom, tradition and bigotry, when they make an intelligent study of themselves and their farms and work both to their full capacity. There is one question which nearly every farmer is called upon to consider, and that is the policy of incurring debt. The propriety of that proceeding from a money-making point of view depends entirely upon circumstances. There is a great hue and cry raised by the agricultural press and in farmers' meetings about running in debt, and yet three fourths of the men who denounce debts so vigorously have found credits a leverage that has materially aided in lifting them to a condition of financial independence. Debts incurred for productive property are all right. Debts incurred for unproductive property are all wrong to persons of limited means. Borrow money at seven per cent. and invest it in a farm or on a farm in such a way that it pays fifteen or twenty per cent. and you are engaged in a business-like and sensible proceeding. Borrow it at three per cent. and invest it in fast horses, twenty-dollar boots and seal skin sacques and wealth will come to you about as soon as it does to the boy who hunts for the bag of gold at the end of the rainbow. Debts will never impoverish a wise farmer or enrich a foolish one. Thousands and hundreds of thousands of men have come into these western states, run in debt for their farms, run in debt for building material, for clothing, for stock, for all the necessaries of life. and by years of economy and toil have become financially independent.

The wonderfully rapid settlement and development of the

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west would have been impossible but for the fact that industry and integrity found credits in the money centers of the nation.

The cry that we should avoid debt as we would death is a thoughtless and senseless cackle.

Take two men and place them upon farms of equal value. Give them no floating capital. Let them both be careful and economical. Let one avoid debt as he would death, and let the other exercise his sense and judgment in the matter. You will find one of them running a very safe and a very narrow business, and you will find the other using his credit to buy the stock he needs when he can buy it cheap, to hold his grain when there is good prospect of a raise, to put up his buildings when it can be done at the least expense, to enrich and make productive his land and to buy those tools that he can use profitably in his business. The first may not score a failure but he can no more reach the degree of success attained by the second than a slave can perform the labor of a free man.

The young man who expects to make money on a farm and who has no capital must do one of three things—buy a farm and run in debt for it—rent a farm or hire out by the month. Turn these alternatives around and take the last one first: What are the chances of making money in working out by the month? The wages are likely to average about $250.00 per year. There is no certainty of obtaining an agreeable place to work. There is little opportunity for recreation and less for mental improvement. The position of an employe with a monotonous round of duties stimulates neither ambition nor thrift. The chances are that in ten years the young man may have saved $2,500.00, but at the end of that time he has become an incorrigible old bachelor, he has had the blight of a fixed income upon him, his value as an individual force is about equal to that of the old line department clerks at Washington. He may have become methodical but his self confidence is at a discount. If this picture does not suit, the young man can rent a farm. He can take some place on shares. Ordinarily his share is one half, When there is

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no crop he has one half just the same and all of the expenses. Occasionally he settles down on a productive place and begins to make money in spite of the odds; but it very often happens at this point in his experience that the farm is sold from under him and he drops in a sort of discouraged way upon some other place and goes through the same formula. Farmers in England rent farms and get rich. I have never heard of a case in this country. There are two classes in the United States that exist to the perpetual ruin of each other — the agriculturists in cities and town who own farms — and the farmers who rent them. To be sure the renter has no taxes and insurance to pay, he has no debts haunting him like an evil spirit, he has no capital stock at stake in any venture — the burden of property does not rest upon his mind, but the result of all these pleasant conditions usually is that he becomes simply shiftless. There is no stimulus like that of necessity — no inspiration like that of the imperative mood. The young farmer who rents his farm can earn his living and have few cares. He can support a family comfortably. He is obliged to do nothing more to make his accounts balance. His narrow margin of profits does not excite his ambition and year by year he becomes less a man and more a machine. The outlook in this direction for a young man is not encouraging. There is one thing left for him to do. He can buy a farm and run in debt for it. It is a serious step to take. It means or it should mean hard persistent work, a close and constant economy. It is however, an almost certain road to success to those men who have a divine spark of native energy in them.

Thoughts of a constantly overhanging debt are not pleasant, but they drive away the spirit of extravagance, they hold their victim closely to his business, and by their very annoyance stir his money making capacity to its lowest depths. Of course there is a class of men to whom this does not apply. Men who go in debt as they do into a quicksand, plunging deeper at every move — men who get drunk mentally on credits, whose principal ambition is to dodge old debts and make new ones. They are outside the

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realms of common reason and common sense. But the average young farmer, industrious and honest, can do no better than run his chances, buy a farm and pay for it as soon as he can.

There is one other point to be considered in this connection. Shall the young man who wishes to make money on the farm go west or not? The celebrated advice of Horace Greeley has not brought unmixed joy to those who have followed it. I believe that New York is a better state to make money in than Wisconsin, and that Wisconsin is ahead of Dakota in this respect. It is a good thing for a few young men to go west. It is not a good thing for the majority. Why should a young man leave all the loved and honored associations of his home, the friends who are a part of his capital stock in life, the locality where he knows the productive capacity of every farm, the state with whose history he has been familiar, and go further toward the outskirts of civilization, where the people are all strangers, and where there is neither the variety, the beauty, nor the profit to life which there is near the great commercial, intellectual and social centers of the land. The popular theory is a mistake, and many a man and many a woman spending their days on the wind swept prairies of Dakota, have registered the same opinion in their innermost thoughts, and they will go through life poorer in purse, poorer in knowledge, and poorer in happiness than they would have done in their native homes. There is not space in the limits of a brief paper to treat the subject of money making as it relates to farmers as it should be treated. It is the problem which each one of us is trying to solve. We can solve it best when brains and muscle work together for a common end. Farmers will be more successful in their business when they become more business-like in their methods, when they keep their accounts with the same accuracy that a merchant keeps his, when they study the hard questions of their calling as a lawyer studies his cases, when they carry into their vocation the enthusiasm of the politician and the persistence of the book agent. Year by year we can see an improvement in all these respects. The farmers of the United States are be-

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coming both rich and sensible. Economy, industry and intelligence are bearing fruit not only in the individual lives and characters of farmers, but in handsome houses and larger barns, in better fences and cleaner fields, in vines and trees and lawns and libraries, in well bred stock and well trained children.

Prof. Whitney, of the university of Michigan, was called upon and spoke as follows:

Mr. President, Ladies and Gentlemen—I had no idea of being called out at this time, and especially as I know some of you here are aching to have these exercises close, that you may test the hospitality of your most excellent governor, and it is not my purpose to detain you from that pleasure that you are expecting, for any length of time. I would have rather spoken in the afternoon or in the morning if at all. I have been asked a number of questions in regard to matters that we have had under consideration in Michigan for years, the same as the farmers have in this state, and I presume in every state where intelligent agriculture is carried on—matters that relate to the education, the happiness, the prosperity of the larger portion of the citizens of the state—the farmers. As your governor said to-day, a large proportion of the people of this state are engaged in the tillage of the soil, producing, as the statistics of the United States show, a very large proportion of the real original wealth produced in the state. Last night the question of the uniformity of text books came up, a question that is coming before the legislature, and in which I am highly interested, and some excellent thoughts were deduced. Twenty-one years' experience in the public schools of my own state, as superintendent and teacher, to say nothing of that as pupil, has taught me the absolute necessity of a uniformity of text books. That uniformity is best and goes farthest, that is the most extensive, or the highest in its unit. If the school district is the unit, it will be but very moderate, and it will not be, as was said last night, very effective. If the township is the unit, as in the state

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of Massachusetts, of course that spreads over more territory, and will work better. If the county is made the unit, it is better still, and if the state can be made the unit, through some provision of law that shall be proper and just, and work equally to all and a detriment to no one, that is the best provision that can be made in that direction. Men have tried it in the city in which I reside. In our primary department, we supply all the children in the public schools of the city. I will say that the expense, so far as the taxes are concerned, and the expense of it in general, is far less, and we think it about one third. There are reasons for this.

In the first place, the pupil has the same book but once, and they all have the same book, and have it alike, and there is a little responsibility thrown upon the child, who is naturally heedless, by some one who is closely connected with the power of supplying, that is, the teacher employed by the board of supply, to see that book is well cared for, and many children in our public schools are taught habits of care that they would not get if they owned the book. There are many little points that come up, as you will find on trying it, in this direction. I thought last night, however, that perhaps there was one thought on the side, as I heard our venerable secretary say that all questions have two sides. I thought that some of the future homes would lose the expensive library that they now have of school books that have had to be bought from time to time, and never used but once or twice. There are in all homes large libraries of this kind, that of course we might miss. But the use of school books under a uniform system would engender habits of thought, and a love for study that would put general works into those libraries, one volume of which would be worth 100 of such as are there to-day. This question leads directly to another, the question that was brought up this afternoon. There are two characters of education; one general, which every child in America ought to have; the other, special, which, if he is rich enough to live without it, is not necessary, though all are liable at some time or other to need the special education. I mean by a general education, a drawing out, which is the

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meaning of the word, of the powers of the individual, not in one direction, but in all.

We have mental abilities. God has given us every power of thought that we have for bettering our own condition, and the condition of the world in which we live, and those by whom we are surrounded and with whom we come in contact daily, making them better, and helping to make them more useful to the world. That intellectual power it is our duty to cultivate, but it is equally essential that the physical abilities which God has given us should also be cultivated, developed, expanded, strengthened, until that perfect symmetry of physical excellence that God intended man should have is attained. You may cultivate the intellectual and leave the physical weak, and the one soon overpowers and puts the other in the grave. You may give such physical education solely, and have a giant physically, but without mental ability to direct the giant power of the physical form, and then you have a monstrosity. Cultivate both of these, and still you have not the perfect being that the Infinite One intended, you have a man that has power of mind and body, but who lacks the greatest of all the powers — moral power. He lacks that quick perception of another's rights. He lacks that love of his neighbor, and he lacks those powers and capabilities that God would have manifested in everyone, and which I believe that every true person in the world will consider should be taught, should be quickened and to be exercised by the education and instruction we are giving our youth from the time the child breathes its first breath until the time it goes forth into the world a man or woman; the idea of morality, of individual responsibility and duty. There are three great ideas in education then. Horace Mann taught this fifty years ago, when he showed that these great forces should all be developed to make the perfect man or woman, the man or woman that the nation needed, that would honor God and produce wealth in the exercise of the powers that they had. That is general education. Every mother's son and daughter of this nation needs it, and no convention of farmers, no convention of men and women on earth,

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ought ever to disparage it. There never was a man living that had too much of it. There never will be. There never was a man yet who knew too much in the hights and depths of intellectual culture; there never was a man yet who had too perfect a physical existence by thorough training of the physical powers that God has given him. There never was a man that had too much perception of his responsibilities to his fellowmen or of his duty to God. (Applause.)

This general education would have all this, and I believe it is the duty of the state to foster and encourage all this. But is there nothing further? These we should all have, but we have now come to a point where we have a division, and a difference in direction toward special fields. One must use the mechanic's tools, another must teach, another perform some other labor, another must stand next to the earth, the great reservoir of wealth, wherein God in the beginning placed all the wealth the world has ever had or will have; he must stand there with the keys of industry in his hands and unlock those treasures that God has stored there for the use of all the other classes, of whatever name or nature. Who is he? The farmer. And is there a being whose responsibility to his fellowmen, to his country and his God, needs more preparation to perform the duty that devolves upon him than this same farmer, to draw out the wealth that God has stored in the earth, to feed the people of the nation, nay, the earth itself almost, by furnishing the material? Shall we not train him for these responsibilities? They say we shall train the teacher to teach the mind. True. Your normal schools provide for it happily, and they ought to be thorough in that direction. You claim we should have special institutions for the instruction of those who teach and deal with questions of law. That is proper. I for one have no objection to it, and would that more of them came to fill the place that Webster said was vacant, the one at the top. There are plenty at the bottom. Then again, to teach us in our duty to our fellowmen and all that, we have special departments. The mechanic has to some extent his special department, but not what he ought to have. The

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very bill that appropriated lands for agricultural colleges incorporated in the bill the instruction of the mechanic.

We sometimes feel, when a building falls, when a fair ground has a catastrophe by the falling of the grand stand, as though we would put the architect in state's prison and punish him there years and years for not doing his duty to his fellow men. Has our state provided for a school wherein that mechanic may know how to do his duty? Who is to blame? The mechanic or the state? Here we have untold wealth lying in the soil that may bless the people of the state of Wisconsin, and may be a great need to the world, to feed and clothe it. Let us teach those who have the soil in charge how they may best bring it out, in the greatest possible amount, in the best possible condition, at the least possible expense, and leave the soil in the best possible condition for his successor to use it in like manner. (Applause.) All this is to be done. To do it we need preparation. We need scientific investigation and research. The principles of science have been investigated and applied, so that now we may hear the whisper of a neighbor one hundred miles away as though he were present, and recognize his voice. That science is necessary in the mechanic arts. It is necessary all through the mechanical world, and nobody disputes it, but you have from the soil the original material that the mechanic converts into forms of beauty and utility and compactness for transportation, and to do so needs the application of all the sciences known. Shall not then he who has to use all these sciences understand the great forces of nature that he has to deal with? Shall he not know the means by which he can use the forces that God has placed in his hands to better his country and his fellow men? There is no occupation for which it is needful that the state should do more. Its schools should be many, thorough, efficient, and accessible.

I must close by a single thought or two. We boast in our state of having one of the most successful agricultural colleges in the United States. At our last legislature a question that may come up here was raised, whether the results of the agricultural schools, or of our special institutions for

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special purposes, gave fruits sufficient to justify the investment, and means were taken by which the superintendent of public instruction of the state commenced an investigation of all the graduates of the agricultural college for a ong period of time. Letters were written to them and information obtained showing what they had been doing since the period of their graduation from the college. The same was true in regard to the normal schools, to know if the graduates of the normal school had been filling the requirements of graduates at that institution, teaching the public mind. It is a singular fact that of the graduates of the normal school 95 per cent. of the entire number had taught an average of nine years out of the ten allowed for them. I do not recollect the percentage, but that was true of nearly as large a percentage of the graduates of the agricultural college. Those agricultural graduates are not all on the farm. Many are professors of similar institutions, teaching and instructing in fields that are very important. This leads me to another point that has been raised, the question of teaching practical agriculture in our common schools, the necessity of a text-book, and the necessity of knowledge among teachers to do it. There are three quite important points. There is a natural precedence in this thing. You make a necessity for instruction on agriculture in the public school of your state, and the other two will follow. Somebody will make the text-book, and the teachers will all be prepared, for they cannot get a place without it. Now keep that point before you. Make it obligatory and it will be done. I think that the state of Tennessee has already made it a requirement that primary agriculture shall be taught in the schools of that state. Already one gentleman has written a text-book on the subject, and it can be obtained very readily. While I do not think it is as good a book as might be written on the subject, yet it is the first and the beginning, and others will follow. Let the states require that the schools shall have the elements of agriculture taught, and the text-book will follow — it may be crude at first — and the teacher will be prepared. Now the agricultural college is one of the schools needed in the preparation

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of teachers. The best teachers that we have in the state of Michigan for our primary schools are under-graduates of the agricultural college.

The curriculum of the college is such that our boys and girls who attend go in February, and the year closes in November, and from the closing of the term in November, until again in February, and sometimes longer by permission, they are engaged in teaching. I say it advisedly, acting as superintendent over them, that the best teachers in the primary schools in the state of Michigan that I have known have been under-graduates of the agricultural college. They come from a practical knowledge, from a vigorous, healthful exercise of the physical system while gaining intellectual instruction, they come home with this knowledge to us among the farmer boys and girls of the community. General education, as I remarked, is not taught altogether by the school. It begins with the mother's first instruction. It begins with the smile or the frown that the child first notices, and it lasts all through. The parent can teach a child toward or from any special calling. In one family the children naturally tend one way. It is taught in the family. Next to the family comes the teacher. Let a teacher go into one of your public schools and talk all the while that the child or the children ought to go to some commercial college and get a smattering of commercial teaching, and then get high wages as a clerk and accountant, and somehow you will find those boys, and the girls too, all wanting to go there. There are many schools in our state, and I doubt not in yours, from which children have gone in that way. In the same way I remember my thirst for knowledge, my desire to have a thorough education, came from my teacher's having gone through a similar classical course of study, and a desire was implanted in my breast for it, for I thought he was one of the finest teachers in the world. I wanted to get as good an education as he had, and I did not stop until I got it, but I got my bent from him.

Let our teachers go into our primary schools then with some practical knowledge of farming. Let them be pre-

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pared to teach primary agriculture, not scoff at it, not hold it up in derision, not put something in place of it as far better, but let them give bent, as it were, and tone to our boys and girls, and, instead of teaching them away from the farm, they will teach them towards it. Your agricultural college, if it is what it should be, and I have no doubt it will be, for I have traveled a great deal in the state and find there is not only desire, but an imperative demand for it, should be richly endowed. Some one was discussing this afternoon whether it should have a two year's course or not. When you get your agricultural college, you will have a four year's course in it. You will have a course there that will make these men competent to go forth an honor to those who send them forth. You will have more that will come there and never graduate than of those who graduate, just as in our normal schools. Hundred and hundreds have gone forth as under-graduates, and have paid the state a thousand times over for all the expense they ever put into their normal schools. So in the agricultural college, hundreds and hundreds of boys have gone there and got some grand truths; have remained there one year, two years or three years, and have gone home on the farm and put those truths into practical application. Put your course high enough, but let them go before.

Mr. President, I thank you and the audience for their kind attention. If I have said anything that shall set any one to thinking in the right direction, I am not sorry that I have spoken.

Secretary Babbitt — There is a gentleman here, known to everybody in the state, and I feel very confident that a great many ladies and gentlemen here would like to here him, if but for a few minutes. I refer to ex-Governor Lewis, of Columbus, Wisconsin.

Ex-Governor Lewis — *Mr. President, Ladies and Gentlemen* — I came to your town this afternoon, and know but little of your proceedings, but have been very much interested this afternoon in hearing some of the discussions that have taken place in this room. I want to add one word, and I shall occupy your time but a very few moments, in

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favor of education. I know little about the bills introduced before the legislature, and hence I will say nothing concerning them particularly. But a few words as to the general idea of education, not that I would urge the education of the farmer upon the ground that I have heard stated by some, that the farmer is ignorant, by any means. I believe the agricultural people of the state of Wisconsin are as intelligent as any class of people you will find anywhere in this round world, taking them as a whole. I believe you will find as intelligent people among the farmers of Wisconsin as you will find in any country. When the farmers are compared with the physicians or the lawyers, or with many of those who profess to be higher in the branches of education, while those men may possess a little more knowledge in some given directions, it does not necessarily follow that the knowledge they have obtained is better for the world, or is better for the man, than the knowledge which is possessed by our farmers.

The farm is the school of all the great men of the country. Go into the cities and find the great men of the country, and as a general thing you will find they started on the farm. They got their physical education upon the farm. They generally stayed there until they were sixteen or eighteen years old, and they acquired that push and ability, physically and mentally, which enabled them to succeed in the city. You will find, as a general thing, that the great men of the country who have succeeded in the large cities started in the country. They started upon the farm, and then with a good physical education, and with powers of endurance, they went into the city, with good habits which they acquired upon the farm, and made a success. Go with me, ladies and gentlemen, if you will, into Northern Siam to-day, and you will find a people there who have not sufficient knowledge to make their own clothing. They live upon the wild rice and the wild fruits in the jungles. They are little above brutes. They are little above the monkey. What makes the difference between that people and this people? One has been educated morally, intellectually and

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physically, and the other has not. They have not sufficient energy and ability to build themselves houses. They live in hollow logs and in the trees. They have not sufficient ability to pass laws, have marriage relations, or anything of the kind. They simply live and vegetate there in the wilds of the forest. Go with me to southern India to-day, and you will find there they are just commencing their barley harvest. In that old country that is thousands of years old, they are thousands of years behind Wisconsin to-day. You will find perhaps a dozen or fifteen women going into the field, and all the implements they will have will be a little stick fifteen or sixteen inches in length. They will go out in the field harvesting, and those women will sit on the ground and gather together sufficient barley to make a load, and then these women will take the bundle to their threshing place, putting it on their head and carrying it, and at the threshing place they have other men and women and donkeys all mixed together treading out the grain. After they tread it out they take it and throw it up in the air and let the wind pass through it, and thus they fan it and clean it. That is an old country, thousands of years old, and the only agricultural implement they have for cutting their grain is this little stick, and you will see those people there with a crotched stick, and they are using it as their fathers used it thousands of years ago.

Go into old Palestine to-day, go right out on the plains of Sharon, where the people have lived and vegetated for thousands of years, and you will find them plowing with the crotched stick. Sometimes they will have a little donkey beside a woman to draw the plow. They go into the jungle and cut a crotched stick and dig up the ground about as much as a hog would root it up. You will find that in Egypt and in China. You will find to-day no agricultural implements in China. There is a government of 400,000,000 of people who have been vegetating and living there for several thousands of years, and yet they have not advanced. They are thousands of years to-day behind the United States, and why? Because they are not educated. You will find this the case in all these old and ancient countries.

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They have no agricultural implements. They have nothing but their hands to work with. Another thing; where ignorance prevails you will find that woman has no position. She has no position anywhere in the world equal to what she has in America. You go to China to-day, and go back in the country, and you can buy the brightest and finest looking girl they have there for $50, and buy her of her father and mother. They will sell their children just as quickly as they will their cattle and horses. In India to-day one of the finest old castles they have there, in old Benares, you will find filled with monkeys, and you will find men and women going there and feeding those monkeys and worshipping them. They believe in the transmigration of souls. They believe that when their fathers and mothers die their souls went into these monkeys, and hence they worship them, and you will find that country overrun with insects and serpents and tigers and wild animals. The country has been inhabited for thousands of years, and yet thousands of people are devoured every year. Those tigers come up within three to five miles of the large cities, and they capture a woman or child and lug it off into the jungle and eat it up. This is a common thing, and why is it? They are superstitious. They say their fathers and mothers have died and their souls have gone into these animals, and they will not destroy them. They cannot eat meat because they say they might eat their step-mother or their grandfather.

Why is the difference between that people and this? It is because they have not been educated morally or physically or mentally. When you compare these things with this country, where education and morality prevail, how can any one say a word against the education of the people? We have an intelligent people, but I never knew a man to know too much. Let education and the bible go hand in hand down the track of time, accomplishing their good works, until love, liberty and equality shall pervade all hearts and be sounded from every tongue. (Applause.)

Mrs. Severance.— I wish to make a few remarks upon the very able paper that was read by the gentleman this evening. It is a subject that I consider of very great importance,

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and a good many points were touched upon that ought to bring out a great deal of instruction. Really, to me the great use of these papers is in bringing out from different persons in the audience different views of the same subject. He made one statement in the beginning that is very true, and that is that farmers need not expect to become very rich or to become millionaires. That is true, and I might add further that there is no man in the world that has become rich as a product of his own toil, no matter whether upon the farm or any where else. Any man that becomes a millionaire becomes so by virtue of his accumulation of other persons' toil and appropriating it to himself. He speaks of a farmer having only three chances; one is to work out by the month, another to lease a farm, and the third to buy a farm and run in debt for it. Now he suggested that the man who was most likely to make a success would buy a farm and run in debt for it. Sometimes, of course, people that buy farms and go heavily in debt may get out of that indebtedness; but look at the position of so many that have bought farms and gone largely in debt. The farm is mortgaged, of course to secure the debt, and perhaps the husband dies and leaves the family perfectly bankrupt and in want, because of the mortgage being foreclosed and they sold out of house and home. It seems to me the grand mistake our people have made in the matter of homes has been in not allowing every individual member of the commonwealth to have all the land that he is capable of using, not to own vast tracts of land, as many do, thousands of acres perhaps, and live in the cities, but that each man has a right to as much land as he can cultivate, the same as every individual has a right to the air that he can breathe, and to the water that he can use.

Now I take the position that, coming right back to first principles, there can be no real title to any land given to any individual, for, in the first place, where did the first man get his title to land from? The land, like air and water, is the natural gift of nature for the use of the whole people, one as much as the other. Each one should have a right to a home for himself, and there is where our government has

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made a mistake, in the first place, in granting these great corporations and moneyed individuals such vast tracts of land. The gentleman further states that it was a mistake in a great many people going so far west for their homes, and recommended that they buy in the state of New York. The state of New York is a great state. It is my native state. I think very much of it. But it strikes me that there would not be a very good chance for the majority of people of this country to settle in New York state. Besides, all the farms are pretty much under cultivation, and they do not want to all sell their farms, even if somebody wants to own them, so that people are compelled to go west for lands for their homes. Now if the people are wise enough to own or control the means of transportation and inter-communication, then the people in the far west would have just as good advantages as the people that live in New York state, exactly. Now we have hit upon one point that it strikes me could be carried further in our postal system. We have a postal system to-day that carries mail from the remotest part of the country to our great centers, New York or wherever it may be, at precisely the same rates as to points contiguous, and this has been carried out to some extent in our telegraph and express systems, and it has been found that the revenue of our postal system has been increased by the late reduction of our postal rates. I believe that if this same system was carried out in regard to our railroads that there would be so much more travel and shipments from one part of the country to the other that the revenue would be equally as great as it is now. At any rate, it would prove a great blessing to the people, in so far as their products could be exchanged from one extreme part of the country to the other, and people would travel from one part of the country to the other, and thus increase their knowledge and fraternity, for there is nothing that expands the mind of men or women like traveling through the country, meeting with the people of all the different states and localities and exchanging ideas upon all these great questions, and it strikes me that when the people become very wise they will

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control these great thoroughfares everywhere, and control them in the interests of the people, and they will not be controlled in the interests of special corporations. Then the people in the far west will have all the advantages of the people that are immediately surrounding New York, and *vice versa.*

We have been told by one speaker of the wonderful things that our system of education has done for the people, and he cited China as an example of the other extreme in that; even in China, at the present time, people sell their daughters, and for not very large prices either. Well, we do not do just that thing in that same way here, but I know people that sell their daughters, really, and I have known men, I regret to say, in this country, that have sold themselves, and especially on election day. It is a common thing, and I agree with the gentleman that spoke here, that while we are having intellectual culture, and while we should have physical culture, we need moral culture. Just as much, and when I said this afternoon that we need the cultivation of all the faculties, that of course included the moral faculties. In the first place, the great director of everything in the human brain is the reasoning faculty. Reason tells us what is right. There is a great mistake often made by people's assuming that conscience tells us what is right; that never tells us what is right. It says, "Do right," but reason is the guiding star that points out what is right or wrong. Some of the most conscientious people in the world have done some of the most wicked things under the control of conscience, because their reason was not active enough to tell them the right relations between man and man, or what what really was right and justice to others. So, I say, reason should guide us in all these affairs, and conscience be cultivated to that extent that it will say, "Do right," after reason tells us what is right. In the human brain there are a great many different faculties. Each faculty has a particular function of its own. Now, if there is an antagonism between any two faculties, the stronger faculty will control the weaker, the same as in an antagonism between two individuals. Now, if a

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person's reason tells them a certain thing is right, and they have rather weak conscientiousness and rather strong acquisitiveness, their acquisitiveness will control their conscientiousness, and although the reason tells them it is right to be just to their neighbors, their acquisitiveness will make them unjust by taking to themselves what does not belong to them. When this is understood, and we learn that we must cultivate these lacking faculties so that they become master, then our moral natures will be developed, and not till then. In so far as the conduct of our government is concerned, and our relations one with another, it seems to me there never was a time when Dr. Holland's words were more appropriate, than at this time, and that would be my particular prayer if I made a prayer to-night.

"O, give us men. A time like this demands,
Great hearts, strong minds, true faith and ready hands;
Men whom the lust of office cannot kill,
Men whom the love of office cannot buy,
Men who possess opinions and a will,
Men who love honor, men who will not lie,
Men who can stand before a demagogue,
And damn his treacherous flatteries without winking,
Strong men, sun-crowned, to live above the fog,
In public duty and in private thinking.
For while the rahble, with their timeworn creeds.
Their large professions and their little deeds,
Mingle in worldly strife, lo! freedom weeps,
Wrong rules the world, and waiting justice sleeps."

Mr. Hinton — Notwithstanding all that has been said, I really think that our esteemed friend, Gov. Lewis told us something to-night that I doubt whether any of us knew before, that there is a part of the world where the step-mother is really respected. I would like to ask how they treat their mothers-in-law there. I will tell you why I ask it. I read the other day about a man out in Kansas that had a mother-in-law he did not like. He owned a panther that he only had had a little while, and it seems that he and his wife put up a job together to take a long journey and not get home that night; and just before they left they

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would turnthe panther loose expecting of course that the mother-in-law would be got rid of, but they were very much disappointed on returning to find the panther dead, and, as the husband said, he never saw the mother-in-law look so well in her life.

FRIDAY MORNING.

Mr. J. W. Wood in the chair.

SWAMP LANDS.

By WM. OWEN, of Portage.

Mr. President, Ladies and Gentlemen of the Convention: I will not attempt any apology, time is so short. If there is any fault found on account of my coming before you, let it be laid on the Hon. President and his worthy Secretary.

In this paper I shall attempt a brief statement of the main facts regarding the acquisition and disposal of our swamp and overflowed lands, and I refer you to the official records for the accuracy of what I say.

For the information of those who may not already know, I will mention that the legislature of 1882 passed a resolution requesting the secretary of state "to collect and cause to be printed, copies of the original grant made by the United States to the state of Wisconsin, of the swamp and overflowed lands, and of all laws of the United States and of this state pertaining to this subject, together with all decisions of the department of the interior and messages of the governors of this state in relation thereto, and also all correspondence between this state and the government of the United States respecting the acceptance and selection of such lands as he shall deem necessary for a full explanation of this subject."

Such a collection was made, one thousand copies were printed and distributed, giving six copies to each member of the legislature. It made a book of some two hundred

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and fifty pages, of the size and type of the ordinary session laws. This book may be of especial value to any one who may have occasion to investigate this subject, if he should be lucky enough to find a copy.

Perhaps you will bear with me, if I anticipate and answer a question that may arise, at this point, to wit: Why should you, and the people of a section of the counties of Columbia and Sauk feel so much more interest than others in the matter? I think I may safely answer, that it is on account of our exposed situation to the excessive floods of the rivers in mid-summer of late years, and the damages and losses, resulting therefrom. We have been troubled and have suffered losses for eight consecutive years; but the years 1880, 1881, 1882 and 1883 were the most disastrous.

Some of the people of the towns of Caledonia and Lewiston in Columbia, and of Fairfield in Sauk, suffered very serious losses in 1880 and 1881. Many of the farmers of those towns sold off their stock without discrimination, young or old, for what they would fetch. They had no fodder and no pasture left. Trains of young cattle and sheep were shipped to Iowa in those years. Whole crops of grass, some oats, corn or whatever the people had were ruined. The people of Lewiston being backed up by the Fox River Valley moved first, and applied to the legislature for aid for a levee; and obtained it. Fairfield and Caledonia appointed committees to look up their swamp land fund; they came to the legislature also, and obtained an act giving them the whole of any funds that might yet come to the state from sale of lands or indemnity for those sold by the general government; in their respective towns, though sorely needing these funds, they have not yet received a cent. Hence our interest.

Now, we will assume our narrative. This subject being so extensive, it is hard to know how to deal with it in a short paper. We find the case so masterly epitomized and argued by Governor Randall in his special message to the legislature on February 20, 1860, that we shall make liberal quotations from him. It appearing from the records that he was the best posted swamp land governor we ever had,

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and as he was an eminently good lawyer, his words are entitled to our special consideration.

"By act of congress, approved September 28, 1850, it was provided 'that to enable the state of Arkansas to construct the necessary levees and drains to reclaim the swamp and overflowed lands therein, the whole of those swamps and overflowed lands made thereby unfit for cultivation, which shall remain unsold at the passage of this act shall be, and the same are hereby granted to said state.'"

Section two made it the duty of the secretary of the interior, as soon as might be practicable after the passage of the act, to make out an accurate list and plats of the lands described as aforesaid, and transmit the same to the governor of the state of Arkansas, and at the request of said governor, cause a patent to be issued to the state therefor; and on that patent the fee simple to said lands should vest in the state of Arkansas, subject to the disposal of the legislature thereof, etc.

Section three provided: "That in making out a list and plats of the lands aforesaid, all *legal subdivisions*, the greater part of which is 'wet and unfit for cultivation, shall be included in said lists and plats; but when the greater part of a subdivision is not of that character, the whole of it shall be excluded therefrom.'"

Section four recites: "That the provisions of this act shall be extended to, and their benefits are conferred upon each of the other states of the Union, in which such swamp and overflowed lands known and designated as aforesaid may be situated."

This synopsis of the act is the governor's, verbatim, but he has left out one important provision at the end of section two, as follows: "Provided, however, that the proceeds of said lands, whether from sale or direct appropriation in kind, shall be applied exclusively, as far as necessary, to the purpose of reclaiming said lands by means of the levees and drains aforesaid."

We will now resume the governor's argument in the message: "By this act the right of the state 'to the whole of the swamp and overflowed lands made unfit thereby for culti-

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vation' was fixed, and it could not be divested of that right by any act of the government authorities, nor released except by the direct action of the law making power of the state. No agent or officer of the state could do any act directly, or indirectly, releasing the right of the state to the whole or any part of 'whole of those swamp and overflowed lands.' If the governor or any other officer or agent of the state could release the right of the state to any of the lands, which were in fact swamp and overflowed, without an act of the legislature authorizing such release, then he could release the right of the state to the whole of them, and the extent to which the state would be benefited by such a grant might depend upon the whim, caprice, lack of judgment or dishonesty of the officer or agent. The right of the state cannot be foreclosed by the arbitrary act of any department of the government, nor can it be concluded by the act of any officer or agent of the state, except when he is expressly authorized by the legislature, until in the language of the act of congress, the title to 'whole of those swamp and overflowed lands made unfit thereby for cultivation, which shall remain unsold at the passage of this act' shall be vested in the state. The right of the state does not depend upon the lists made out or upon the issuing of patents to the state, but upon the act of congress, and upon the fact whether the lands were swamp and overflowed lands made unfit thereby for cultivation."

The state is entitled to all such lands, whether the United States surveyors have reported them as swamp and overflowed lands, or not, unless the state by an act of its legisture, confined itself to the precise report of the United States surveyors, which are well known, both to the state and government authorities, to be, and to have been, very inaccurate. The state, as will appear by the correspondence sent to the assembly, has never acquiesced in any policy which has been pursued by the government. The fact that 1,600,000 or any other amount of lands have been approved to the state, as taken from the surveyor's report, does not and cannot exclude the state from the possession of, or right to all other lands which were, in fact, swamp and overflowed lands, al-

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though not so returned by the government surveyors. An act of the legislature of this state approved by Governor Dewey, March 15, 1857, during the first session of the legislature, after the passage of the act of congress authorized the "Governor of the state to appoint such number of persons as he may deem advisable to act under his direction in selecting the swamp lands granted to this state by an act of congress, approved September 28, 1850." It also authorized the employment of surveyors, chain-bearers, etc. The legislature, as far as I am advised or can discover, provided for no other mode of selecting these lands, except through agents, surveyors, etc., so appointed. The act of congress of 1850, did not provide for a conference of the commissioners of the United States land office with the governors of the several states, as to the adoption of plans for the selection of these lands.

In the case of this state, Governor Dewey in his letter to the surveyor general, dated June 3d, 1857, less than three months after the legislature passed the act, authorizing the appointment of agents, surveyors, etc., for the purpose of selecting these lands, and without any law authorizing, so far as I can discover, any such change of policy, said: "I have to advise you that this state is willing to adopt the field notes of the surveyors, on file in your office, as the basis of making out lists of lands granted by the act of congress named."

The letter of instructions of the commissioner of the land office to the surveyor general of Iowa, Wisconsin, etc., dated November 21, 1851, says: "This act (meaning the act of September 28, 1850), *clearly and unequivocally grants to the several states, those lands which, from being swamps or subject to overflow, are unfit for cultivation.* In this class are included all lands which, through dry parts of the year are subject to inundation at the planting, growing or harvesting season, so as to destroy the crops, and therefore are unfit for cultivation, taking the average of the seasons for a reasonable number of years as the rule of determination." "You will please make out a list of all the lands thus granted to the state, designating those which have

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been sold or otherwise disposed since the passage of the law, and the price paid for them when purchased."

"The only *reliable data in your possession* from which these lists can be made out, are the field notes of the surveyors, on file in your office, and if the authorities of the state are willing to adopt these as the basis of those lists, you will so regard them. If not, and those authorities furnish you satisfactory evidence that any lands are of the character embraced by the grant, you will so report them."

Here are two methods of determining what are swamp and overflowed lands within the meaning of the act of congress, one from the field notes on file in the office of the surveyor general, and the other by the satisfactory evidence furnished by the state authorities, that any lands are of the character embraced in the grant.

We must now leave good Governor Randall in the middle of his masterly argument and we will quote Governor Fairchild's message of 1866.

"In 1850 congress granted to the states all the unsold swamp and overflowed lands situated within their boundaries respectively."

"Shortly after the grant was made the commissioner of the general land office proposed to the states to take the lands by one of two alternatives: Either by having an actual survey made, to determine which were swamp lands, or by accepting the plats and field notes of the United States surveys, and receiving the lands named in them as swamp and overflowed lands as the share of the state."

Governor Dewey, by letter to the surveyor general of Wisconsin and Iowa, dated June 3, 1857, decided to take the lands as they were designated in the government survey.

It was very soon discovered that there were many thousands of acres of swamp lands in the state, which did not appear as such in these plats and surveys, and that this state was not receiving all the lands to which it was entitled under the grant. Upon request being made to the general land office for resurveys, with a view to correct errors, in order that the state might receive all the lands to which it was entitled, it was held by the authorities at Washington

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that the state having once decided to receive such lands as were designated in those plats and surveys as swamp and overflowed lands for its portion, it was bound by its own action, andthat no change could be made.

"This matter having been brought to the attention of the legislature, a survey was authorized to be made, for the purpose of testing the correctness of the United States plats and surveys. This survey was made and a report thereof made to the governor of the state, and by him presented to the legislature in 1860." I will say here that this survey was made under Governor Randall and completed as far north as the boundaries of Columbia, Sauk, etc., from the Lake to the Mississippi, and showed the state to be short 600,000 acres of swamp and overflowed lands as far as they had gone, and that they were finding more errors as they went north. An estimate of the loss to the state on account of these errors was made. Mr. Whitelaw who was superintendent of the work laid it 1,000,000 of acres more at the same ratio of errors as they found in the portion already surveyed. Thus, making the total deficiency 1,600,000 acres.

This survey as far as it went, was prosecuted vigorously and was costing the state considerable money. The authorities at Washington refused to receive it as additional proof; then some wiseacre introduced a bill into the legislature to postpone its further prosecution until the government authorities should agree to accept of it as a finality. So, unfortunately, it was stopped. The next governor getting any considerable concessions is Smith, who told the writer in July, 1880, that he expected to obtain 100,000 or possibly 150,000 acres more of swamp and overflowed lands, by going over the old lists more carefully and not attempting to renew the old controversy. As a result he obtained 526,606.

Included in this concession were some 5,000 acres belonging to the town of Caledonia aforementioned. Most of it laid in town 12, range 8 east. Some parties there interested went to test its accuracy and consulted a surveyor's map and computed the number of acres of lands of that char-

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acter at 6,200. It was not deemed absolutely correct, owing to a slight deficiency in the map of the figures denoting the number of acres in some of the fractional lots, notwithstanding it was deemed a close estimate. Mr. Foresman, head clerk in the land office, was applied to, and reported the number of acres at 6,094 on the old state survey, which we take to be about the exact number, still leaving a shortage of over 1,000 acres in this small township. How many such are there in the state?

There are no doubts now of the incorrectness of the surveyor general's report of these lands; but more especially of the overflowed lands. Some parties claim, that the surveyor general's instructions to his field men did not require them to particularly note the overflowed lands in the earlier surveys, of this I have no means of judging. Let it be as it may, it stands us in hand to watch this matter close, if we mean to get our rights.

After Governor Smith had these matters looked up and the concessions made, it does not appear, that we have yet received any titles or had any indemnity paid over. $141,639.68, conceded by the department of the interior as due to us has been witheld by the secretary of the treasury on account of war taxes not fully paid by the state to the general government. Does any body know by what authority a special fund like our drainage fund is held back? His excellency Governor Rusk I understand visited Washington and congress last winter with a view to ask for the remission of these war taxes. We appreciate the effort and hope he will succeed.

Governor Smith in his message of December 31, 1881 says: "In making the revision it was found that the United States had sold since March 3d, 1857, 435,081.33 acres of land now determined to be swamp, and also that of the lands previously patented to the state as swamp, 319,900 acres were not of that character; after deducting this latter from the former there remains a difference in favor of the state of 115,181.33 acres."

Right here ladies and gentlemen of the convention, I wish you to note particularly, that whereas, before we could go

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behind the surveyor's records to get any more swamp lands than were therein designated as it was held we were concluded by the act of Governor Dewey in accepting the method of selection by the records, etc., proposed by the government, that now, we are called upon to surrender these 319,900 acres selected from those records according to the method adopted; and patented to the state as such on account of their not being of the character designated in the original act. It seems to me, that if we are bound down to these field notes, plats, etc., and that we cannot deviate therefrom in making our selections, or in correcting errors, that those 319,900 acres and any others similarly situated, are ours beyond doubt though they be as dry as the top of the Blue Mounds; and that they never should be surrendered by the state until we have a general correction of the whole list. Then finally, if we cannot get a fair settlement, are these lands an equivalent for the million or more swamp and overflowed lands we lose by this incorrect method of selection? Is it a fair swap? It seems as if the general government takes the turkey every time. It is to be noted, too, that this whole amount of lands sold by the United States, (435,081.33 acres,) represents cash, and for which cash shall come to the state. It amounts to $543,857.66¼; it is proposed now that we take in lieu thereof $141,-639.68; and this last amount is withheld, until we pay a balance of some $207.00 of war taxes.

I tell you my agricultural friends, if we had these sums the $301,655.98 and our portion of the war tax already paid, the $207,685.16 yet claimed as due and the value of our one million or more acres swamp lands, etc., due us on a fair settlement, or the $543,851.66¼ money represented by these dry lands, if you please, it would make a grand fund to help our drainage fund, our agricultural college, or schools, or any other enterprises of our state, would it not?

Thus we see that the acquisition of these lands has been attended with difficulties which are not ended yet. A fair settlement we should insist upon and all our forces ought to be called out to help our state officers, the legislature and

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our representatives in congress, for the accomplishment of this object and that as speedily as possible.

A few words again about the disposal of these lands. They were given to the state for a particular object, namely, "the reclamation of these lands by means of levees and drains." This is the only object for which the grant was made as we understand it; yet the state can hardly be said to have commenced in a fair and enlightened manner the improvements contemplated by the law. Twenty-five per cent. of the proceeds of these lands were given to the school fund and 25 per cent. to the normal school fund from the very beginning until 1865, when the fifty per cent. was turned to the normal schools.

This use of the funds, a glaring misappropriation, we do not much regret, as the money has been put to a good use, and the state is able, and may be willing, some day, to restore the amount to the fund where it belongs. Our civilization is hardly far enough advanced yet to use it wisely, in the line of its appropriation by congress, but the time is coming nevertheless.

Again, what shall we say of the fifty and more acts of the legislature appropriating swamp and overflowed lands or their proceeds to many other different uses, such as building roads, bridges, county buildings, railroads, etc.; uses almost too numerous to mention and in quantities next to unlimited. I said fifty, because I counted that number and got disgusted and gave it up—there are more. Then the law remanding the balance to the counties and towns I do not think to be well guarded, it gives insufficient directions as to its use and does not provide for an accounting to any properly constituted authority provided by the state.

The last part of section 10 of article 8 of our state constitution reads as follows: "Whenever grants of lands or other property have been made to the state, especially dedicated by the grant to particular works of internal improvements, the state may carry on such particular works, and shall devote thereto the avails of such grants, and may pledge or appropriate the revenues derived from such works in aid of their completion."

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This constitutional provision has been sustained already by our supreme court and I hope as our state grows older it will more strictly adhere to its behests. We are admonished in this by what is being done in our sister states. For instance we will take Illinois and quote from its swamp land commissioner's report: "Drainage districts under the present law are being formed" — "in Northern and Central Illinois." "Bureau county has expended over $170,000 in drainage; Whitside, about $90,000; Tazewell, over $60,000; Kankakee, over $30,000. Other counties have spent smaller sums. The counties of Pike, Adams, Alexander, Pulaski, and Gallatin have expended over $500,000 on levees to protect their lands from overflow." "Swamp land as they exist are worth on an average five dollars per acre which is increased to twenty-five dollars by drainage, when they are worth twenty-five per cent. more than uplands." "Thus the state is becoming an empire more potent as an agriculture producer than any other area of ten times its size on earth." "By the way, the great Vermillion swamp, so fascinating to duck hunters, comprising one hundred and thirty thousand acres in Ford, Livingston and Iroquois counties, is being drained at a cost of $45,000. Good by ducks."

Thus, my friends, the world is moving onward and if we do not mean to be left entirely behind in this race of progress we will have to advance too. Do not let us tear down any good institution we have in the state, rather let us build up and improve it, and by no means let us rob Peter to pay Paul. This much abused drainage fund should be carefully husbanded and wisely laid out and the gain to our state will certainly be — shall I say ten, twenty, fifty or a hundred fold? Let those wise enough answer.

Mr. Ford — I wish to say a word in regard to the paper that has just been read. I have been very much interested, and consider it a very valuable paper, very carefully prepared, and what is more than that, on a subject that is just now pressing, or will press very hardly upon us. The

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paper that I read at the opening of this convention on the subject of roads, a subject which I consider a very important one, is closely connected with this subject of the drainage of the swamp lands. I intended if I had had time then, to have commented a little upon their relations.

The number of swamp lands in this state is very large, and so far as I have seen, no intelligent or sustained effort has been made yet to drain them. The appropriations made by the general government and the direction of those appropriations by the state government, has been very correctly stated by the gentleman who has read the paper, but from the beginning there seems to have been an effort on the part of the state how not to do it, and as he says, they have taken away a large portion of this drainage fund and appropriated it to other purposes; for instance, to normal schools. I am aware that I am treading on rather dangerous ground here, for these normal schools are large institutions. There are four of them in this state. A new one is just being started at Milwaukee, which makes five. They have their boards and their trustees in session here now, and they are very influential and valuable schools doubtless; but I want to call your attention to the fact that the normal school fund is the largest educational fund by all means that we have in the state, and if I was going to express my private opinion — perhaps it is worth nothing — it is that these schools in proportion to the amounts of money they are receiving every year, are doing perhaps less educational work in the state than any other. Our common school fund is very bare. Our university fund is none too large. Our normal school fund is enormous. In addition the state took one half. I consider it sheer robbery. They took one half of the drainage fund of these swamp lands, and appropriated it directly to the support of the normal schools. This was in addition to the great fund they had before, and they graciously allowed us to keep one half to be distributed among the counties. Now, that normal school fund amounts, I think, to about a million and quarter of dollars at this time. Three years ago at the meeting of the State Agricultural Society this matter was investi-

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gated to some extent, when this agricultural college question was up, and the report of the secretary of state was brought in and quoted, showing the amount of money they were receiving and the amount of lands belonging to that fund as yet unsold. If I remember, then it was some five hundred thousand acres, something of that kind, but I won't attempt to give figures now, it was very large at any rate. The proposition was then made before this society, and a series of resolutions were drawn and adopted by the society favoring the agricultural college, and in these resolutions was a recommendation that the bill that was then pending in the state senate be passed — that it was the sense of this meeting that that bill be passed, appropriating the remainder of the half of those lands, instead of its going to the Normal school fund, to the agricultural college, to assist them in building up their college, instead of taking it out of the state treasury; and that resolution was passed by this society without any opposing vote. In all this discussion here at this session on the subject of the agricultural college, that action seems to have been entirely overlooked and forgotten.

It seems to me it is something that is worth the attention of this society and the tax payers, and those who are interested in the drainage of this state. Coming back to this system of drainage, I want to say one word and that is this, that we can never have good roads in this state until these swamp lands are drained. We have in this part of the state and in this county alone, thousands of acres of swamp lands, some of the best lands in the county, that, if an intelligent syetem of drainage could be adopted, would add hundreds of thousands of dollars to the real estate of this county, and yet we can do nothing, individuals can do nothing. We can do nothing except by legislation and by some general system. We never will have good roads, we never will have these lands reclaimed to be worth anything until the state adopts some general system of drainage, and gives its attention to these lands and protects them and the funds that were appropriated to that purpose and applies them in that direction.

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Mr. Owen — I would like to say a few words more, and that is with regard to the disposal of these lands — the sale of them. It has been of a very reckless character, in my estimation. Valuable lands in the pineries where they are known to be covered with valuable timber were sold for fifty cents an acre. I do not know who got the bills, but the bills passed and the lands are gone; and another thing, we have not made good use of the money. The money has been appropriated in different ways. I said the law was not properly guarded. I did not have a copy of the statutes when I was writing it. My general idea was that it was poorly guarded, how the money should be spent in the towns when it got back there; but I find, on turning to the statutes, that we do not have a single clause in the statutes giving directions how that money should be spent, and there is no authority to call them to account. Some of the counties have had hundreds of thousands of dollars paid to them in a few years, and there is no accounting to the state at all. I would like to know where the money goes and what use is made of it. I am almost thankful that the school fund has taken this money, because they seem to have made good use of it, and it has not been spent uselessly all over the state. In my locality I know what has been done individually. There have been a few ditches cut longitudinally on the marshes where they could put machines on to do it, and the openings of these swamps have never been properly opened out, and the ditches are of no use at all. I am sorry to make this statement, but the more I have investigated it the more impressed I have been with the fact that the state has abused its power in this trust. It is a trust, a magnificent trust of several million acres of good, valuable lands.

They can be converted into valuable cranberry marshes, and they can be made into valuable pasture lands, the best of them; and if they had been kept until to-day and well used they would have been worth probably as much as the swamp lands of Illinois — five dollars an acre — and if we had got five dollars an acre for them it would have made an immense fund to commence the drainage of this state.

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This appropriation to the school fund is on the supposition that it is not necessary to have all this money. Who is to determine that? Before they have commenced the work of draining they assume that it is determined that it is only necessary to have half of that fund for the drainage fund. It is ridiculous.

Mr. Hinton — Suppose the state to commence a system of drainage, wouldn't it be imperatively necessary to maintain that system of drainage, and if so, would not the cost of draining and the keeping up of the drains be worth more than the swamp lands?

Mr. Wood — There is a resolution in my hands, which has been presented, appertaining to this question,

Resolved, That it is the sense of this convention that the legislature should take in hand the settlement of our swamp and overflowed lands with the general government on the basis of the original act, giving the whole of such lands to the state, and that our executive be backed by proper legislation, if necessary, and sufficient appropriations for that object.

Mr. Owen — There don't appear to be any head at all to this matter now. The commissioners of public lands have the matter in charge. You know who they are and what they have got to do, and the farmers don't take any interest. Nobody looks after it, and they do not look after it very carefully, and I do not think that they have any acts authorizing them to send men to Washington, or appoint lawyers to look into it, or anything of the kind. What Governor Smith did he did of his own accord, he said, running the risk of getting paid for the work with an order from the state afterwards. I was well acquainted with Governor Smith, and had a conversation with him in 1880, after the big floods that almost swamped us up there, and I think that we ought to have some kind of an institution to take care of this matter different from what we have now.

Mr. Broughton — It would seem upon looking over the matter that the funds that have been heretofore obtained have been diverted from the purposes intended, and the whole matter has got swamped in a swamp of fog, and that

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something has got to be done to get out. Consequently, I would indorse the resolution as a last resort, perhaps.

The resolution was then put to vote and adopted unanimously.

Mr. Austin offered the following resolution:

Resolved, That it is the sense of this convention that the legislature ought to pass a law that will be efficient for the suppression of the Canada thistle nuisance, and provide for its enforcement.

Mr. Austin.— The present law does not provide for its enforcement.

Mr. Ford.— I think the same resolution was offered yesterday. I will state further that there is a law on our statute books for the suppression of all these noxious weeds. Possibly there is a defect in the method of enforcement that no one is made directly responsible for that. I understand the gentleman from Kenosha in the resolution, or the draft of the bill that he presented here yesterday attempted to cure the defect.

President Arnold. — The law that he drafted was here, and the question at the time would have been on the indorsement of the bill as drafted. It is very proper to have this resolution come up, and it is in better shape for this organization to present the thing before the legislature. I think the gentleman would accomplish his object better by adopting this resolution.

Mr. Austin.— I present it at the instance of the gentleman from Kenosha.

Resolution put and carried.

Mr. Hinton — In the absence of the gentleman (Mr. Fisher) whose paper was unfortunately put off relative to silk, I wish to say to these ladies and gentlemen that no industry within my recollection dating back some forty-six years in this country, has ever progressed so rapidly, so solidly and so substantially as the manufacture of silk in the United States, and now, when you gentlemen go home, you go and ask any of your merchant tailors, and they will tell you they do not use a particle of anything in manufacturing clothing for sewing silk except that of American make, and the industry as developed in New Jersey first is of marvel-

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ous extent. I am not speaking of the most expensive qualities, but, up to a certain grade the American silk surpasses any silk made in the old country, and that American flag that was made and presented to congress, in beauty of colors, in strength of texture and everything pertaining to perfection, was pronounced there, even by English and French skilled artisans to be equal to anything ever seen.

Mr. Fisher—I am very thankful to the gentleman for the remarks he has made in regard to silk culture, as it is the real fact and truth.

SILK CULTURE.

H. FISCHER.

The last census of the United States shows that there are 382 establishments to manufacture silk goods, with a capital of $19,125,300, which give employment to 9,375 males above 16 years, 16,396 females above 15 years, and 5,566 children and youths, and who earn $9,146,705 in wages during the year; these establishments use $22,467,701 materials and produce $41,033,044 silk goods. It is also statistical that these manufacturers now use over $15,000,000 worth of raw silk. Where do they get it? Do not let the question be answered until we can say at home, and greatly from Wisconsin. While it is true that they now get this raw material in two preparations for the loom beyond mere reeling, and at a cheaper rate they think than silk raisers can furnish it in the United States, but if they were assured that there would be silk sufficiently raised in this country to supply their wants, they would most readily buy at home. Everything in life is progressive. Thus silk culture has passed through several spasmodic periods, and now it is an established fact that it can be raised to advantage in the United States. Yes, more than this—it is an established fact that sik can be raised to advantage in the state of Wisconsin, and while the country from the Pacific to the Atlantic ocean has been awakened to this possibility, why should our beloved state of Wisconsin not devote time, mind and a

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small capital to the encouragement and development of sericulture as a resource for women, boys and girls, that they may have at home an industry by which they may avoid the painful struggle for a livelihood abroad.

While optimistic theorists have done much harm by making fabulous calculations as to the profits of silk culture, it is safe to say, that it adds vast wealth to the nations engaged in it, for the single reason that it can be pursued by women and even children without hardships whatever, and that it requires but little outlay, and only several weeks' work and attention during the whole year. There are hundreds of thousands of families in the United States to-day, who would gladly add some money to their annual income by giving light, pleasant and easy employment for a few months each year to the more aged, to the young, and especially to the women of the family, who are and have been thus far unable to employ their time profitably.

Food is the first thing necessary in sericulture, and this must be good, plenty and convenient to be had, and the next requisite is good eggs. The traditional food plant of the silk worm is the mulberry. There are several species of mulberry. 1st. The red mulberry (*Morus rubra*). 2d. The small leaved mulberry (*Morus parvifolia*). 3d. The white mulberry (*Morus alba*), it bears reddish white berries, which are very sweet. This species is preferred for silk culture in Italy and France, it has many varieties, of which the Maretti-tree, from the garden of Count Maretti, in Italy, is the most preferred; also in several of our states it is profitably grown in the form of a hedge, and the large size of its leaves makes it a very desirable variety.

Osage orange (*Maclura aurantiaca*) is also good food for the worms, but it will never take the place of mulberry trees on account of its long thorns, which make the gathering of leaves rather unpleasant, and as far as my experience goes, I say, while some kind of worms seem to relish these leaves, other kinds will prefer the mulberry if they can have their choice. But as none of these named varieties did well with me in this state. I will proceed to the only kind of mulberry-tree which is a perfect success in this lati-

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tude. That the value of silk culture has, in my opinion, not yet been properly recognized in our own state, seems that the idea and presumption is generally prevailing that our winters are to severe to raise any mulberry-trees, which I found true as to all the varieties named, but since my experiments in silk culture have been made with the Russian mulberry-tree, I find silk culture a perfect success right here for the Russian mulberry-tree is not at all sensitive, it has a large rich foliage, several different shaped leaves are often found upon one and the same tree, it bears large sweet berries, and is so fruitful that in six years a single tree will often give many hundred thousand seeds; it can easily be grown in hedges like the osage orange, which makes an excellent living fence without the dangerous thorns and consequently the handiest way for children or women to gather the leaves. Even twigs can be cut off in order to facilitate the gathering of leaves, without injuring the trees' vitality, and last but not least, the rich heavy foliage of the Russian mulberry trees is not only eagerly devoured by the worms, but keeps them in perfect health through their different periods and produces excellent cocoons.

Since I have proved with my humble efforts that it is not too cold here to produce good, healthy and plenty of food to feed silk worms, and to make silk culture a success. I have several parties with mulberry trees and silk worms, and I trust and hope that the days will not be far distant, when the great state of Wisconsin will point with pride and satisfaction to the production of silk as she does now in agricultural and horticultural products, but in order to achieve something definite soon, the respective agricultural associations ought to encourage somewhat this new industry, which would bring more credit and honor to the respective counties than the premiums lavished upon horse-racing.

After there are plenty of trees planted on one's place so that there is not the question to be raised as how many worms to a tree, but how many trees to a worm, for its rapid growth recommends it for shade and fruit, and being compact, also pliant and susceptible of polish, it is valuable for cabinet purposes and in making charcoals; turners, car-

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vers and joiners like to use it on account of its durability, in case there should be an over-supply for sericulture and after there are good, healthy eggs procured, which have to be kept in a dry, cool place where the temperature is never above fifty degrees; down to zero Fahrenheit and even far below does not destroy the eggs; the development of the worms can be forcibly kept back by putting them on ice, but I think it will seriously impair their fertility. As soon as the mulberry leaf is sufficiently developed for feeding, the eggs are brought to a higher temperature, and still to a higher, as incubation requires progressive heat and the change must not be sudden. The eggs will hatch at 70°, but in some cases 75° or 80° may be necessary, but in any case it will take seven or more days to produce the change. Most important it is to hatch all eggs at the same time, or as nearly so as possible, that they may moult and spin at the same time, which can be accomplished by establishing an equilibrium of temperature night and day and keep the eggs out of a draft and out of the sun's rays, which latter power would kill them in a short time. As the time of hatching approaches, the eggs grow lighter in color, and then the atmosphere must be kept moist by sprinkling the floor, or otherwise, in order to enable the worms to eat the eggshell more easily; the room in which the rearing is to be done should be so arranged that it can be ventilated and warmed if necessary.

Beginners I would advise to try but a small quantity of eggs for he needs more leaves than an experienced hand for the same number of worms, then he must be careful not to raise more worms than he can feed. Some are afraid to begin for fear of not having worm enough. According to Count Dandulo's table of the rearing of silk worms, from one ounce of eggs (about 40,000) they occupy 239 feet space. They will hatch from six to ten o'clock in the morning, when incubation seems to cease until the next morning. Those that first come forth are few comparatively, and as early hatching indicates vigor, it is best to keep them and feed them up for egg producers. As soon as hatching com-

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mences place a few very tender leaves over the eggs to which the larvae will attach themselves soon, and which should be transferred to another tray after several hours, by simply putting young tender leaves upon the mosquito bar stretched across the trays, and these little wonderful mites will soon begin to crawl through the holes of the mosquito bar in order to get upon the fresh leaves. At this time it is prudent to lower the temperature, so as to retard appetite and feed but little until a second or third lot of leaves are secured in the same way; this done, feed up as if all were the same age. By these precautions they will be brought through all the months and ages at the same time, which is of great advantage; each day's hatching should be kept separate, in order that the worms may be of a uniform size, and go through their different moultings or sicknesses with regularity and uniformity, and all eggs not hatched after the fourth day from the appearance of the first should be thrown away, as they will contain inferior, weakly or sickly worms.

To keep the worms in the same stage of development is of the utmost consideration, without this rule it is impossible to feed any number to advantage. These four periods of moultings last each about 24 hours, while they loose their skin, and it is advisable that those which revive these periods of torpor first during which they hold up their heads, should be given very little or no food until the more sluggish follow than to permit one portion to advance beyond another. After they have shed themselves of skin they appear fresh, vigorous, and with increased growth and appetite. The first age lasts about five days and the worms of one dozen eggs (about 40,000), eat about 7 lbs. of leaves; the second age lasts about four days, while they eat about 21 lbs. of leaves; the third age lasts about six days, while they consume 69 lbs. of leaves; the fourth age lasts about seven days with increased appetite for they want about 210 lbs. of leaves; while the fifth and last age lasts about ten days, during which time they devour a good wagon load of leaves, to-wit, about 1,200 lbs. in order to last them through their wonderful process to spin themselves up with silk. Now if we have

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fed them often enough (at least six times a day), from early in the morning till late at night, and my opinion is that twelve times feeding is so much better (it is said that Chinamen feed their silkworms every one half hour), if we have kept them clean, by inducing them to crawl up to a new dray, and as they are too thick and heavy after the first two or three moltings take perforated paper with holes large enough for them to pass through, if we never touched them with our hands, if we kept even temperature, if we kept away from them smoking or chewing tobacco, they all look around now for spinning places, where they can go up, which means they have run their course and are now ready to spin; especially during the last age sufficient food must be supplied for insufficient food now looses a great deal of the silk harvest; they must not crowd each other; the windows should frequently be opened, unslacked lime placed in the room to absorb the excess of moisture and carbonic acid; all worms well taken care of throughout are now so large and heavy that seven will average one ounce in weight, and they will spin from 1,000 to 1,200 feet of silk each. For weeks previously preparations should begin for this period in different ways; such as gathering dried oak leaves and small twigs; straw tied in small boquet fashion; cornucopias of paper or c knobs- these may be strewn about, so that worms which are ready may mount them and spin there, for they will soon take their last meal and then crawl below or above those twigs, leaves, etc., to make cocoons, during the process the worms need watching from spinning together and to make double cocoons, which makes them worthless for reeling purposes. If raisers are not properly prepared for the spinning of worms, much silk is lost, which, in wandering about in search of some object to cling, waste their silk, for whenever they are ready to spin, the silk thread is spun from the mouth, and wherever they go, they spin it after them.

In most countries in which silk is raised, the cocoons are sold to the reeling establishments before suffocation is necessary, but whoever wants to reel his own silk the chrysalis must be killed either by steam, extreme dry heat of 200°

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Fahr. or camphor before the cocoon is injured for reeling purposes by the egress of the moth. The largest cocoons however are now to be chosen as seed for the next year, about 200 cocoons half males and half females will give one ounce of egg. They ought to be deposited in a nice and rat proof place to await the egress of the moth.

Secretary Babbitt — Mr. President, I cannot allow this paper to pass without thanking this gentleman for giving us such an interesting paper. It is curious to observe how this society seems to reach out and take from every nation, every clime, men interested in agriculture. This society stands on the level, and I thank this brother very much for the excellent paper he has given.

Mr. Hinton — This society is reaching out like Babbitt's soap. It is going all over the world.

Mr. Clark — I wish to say this paper has been very interesting to me for I learned that trade sixty-five years ago, in western New York, in an early day before the canal was built. My mother manufactured silk and I helped tend them through and picked the leaves and really understand now all this process that has been read. I have not forgotten it. Just one other thing. We had, I think, what was called a white mulberry. It stood the climate well there. The *morus multicaulis* at one time was cultivated extensively, but it was a failure. In 1847 I brought with me some of the seeds from old trees. I will state, however, we did not manufacture for many years. My mother went through the whole process and made silk of different colors; made what they call twist, and what we did not want to use in the family was sold. I moved to this state in 1847 and I brought some of the seeds of the white mulberry and strewed them under the fences, and they are there yet. They are growing. Still the winters sometimes kill them down, but it does not seem to hurt them any. I cut them down now because I want them out of the way, but they are coming out. They grow six or eight or ten feet high in one year. I presume,

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if I let them grow, there would be enough of them every year to furnish leaves if any person wished to go into it.

Mrs. Severance.—I want to make one remark on that paper on silk culture in which I was exceedingly interested. I have often wondered why more gentlemen have not become interested in that industry, but the whole thing has been explained in this paper in which the gentleman has plainly shown that tobacco and silk culture do not go together. (Applause.) That is why more gentlemen have not gone into it.

C. E. Morgan.—I think I can reply to the lady's question why the production of silk in this country is not a success. I handled a good many cocoons in years gone by and I found it was very delightful exercise and a very interesting study but I have yet to find the party in the United States who has ever heard of any profit from it. I quote the language of the president of the Monatauk Silk Manufacturing Company, whom I had an interview with a few years ago, and he says: "The company is often solicited for aid, and they have given from fifty to a hundred dollars at a time to organizations for the cultivation and production of silk in this country," and, he says: "When the people of America can attend to the industry faithfully and thoroughly and compete with Chinese labor at three cents a day, then there is a profit, and until then there will be a loss," and I fully indorse it.

Mrs. Severance.—That is another reason why it is adapted to women.

C. E. Morgan.—He says they can make more money sweeping the streets in New York with a broom.

Mr. Fisher.—If any one desires to go into it I will furnish silk worms free of charge as far as I can do it.

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ASSESSMENT REFORM.

By HON. D. K. TENNEY.

The settled policy of our revenue laws and of those in all the other states, so far as I know, is that taxes shall be collected upon real and personal property of all kinds alike, according to value, and that credits, in excess of debts, are to be treated as personal property for this purpose as fully as if tangible. The theories and metaphysical notions of certain political economists, that all taxes must ultimately rest on real estate and should therefore be apportioned upon it at the outset, instead of upon personal property also, have been maturely considered by the legislators of th is country from time immemorial, and their enactments have universally antagonized such theories. It has been argued that if the merchant's stock is taxed he must raise the price of his wares correspondingly; and if the capitalist is taxed he must raise the rate of interest on his money, and the public must pay the increase. However plausible these theories, and whether sound or not, it has appeared to those who have been called upon to decide upon them that the man possessed of personal property of a certain value is quite as well able to pay a tax upon it as one with real estate of like value; that, indeed, personal property is in general more profitable to its owner, as it is more readily convertible than real estate, and, consequently, if anything, better able to sustain a tax Whether the tax paid by the owner of real or personal property, or both, ultimately distributes itself, under the laws of trade and exchange, among others, so as to relieve him who originally paid it altogether, has been well considered a matter of too great refinement to afford a basis for an assessment law. The common mind and the legislative mind has settled upon this as sound: "Let all pay alike according to their wealth." Such is the law of Wisconsin already. I have no theories, nor do I believe there are any such, tenable, in opposition to so just a rule.

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DEFECTIVE ASSESSMENT MACHINERY.

Having thus solemnly enacted, the legislature immediately proceed to establish machinery for the execution of their purposes, but in such manner as render them a nullity. They "keep the word of promise to our ear, but break it to our hope." They provide for *elective assessors* in each town. Do men heat a poker to poke themselves with? Was an assessor elected by his townsmen ever known to assess them according to law? If he did so, would he be re-elected? And thus the legislature said: *First*, "It is right that this thing be done." *Second*, "It shall not be done accordingly." The people have endured the injustice for years, complaining oftentimes, especially about tax-paying time, and seemingly in despair or ignorance of a remedy. The legislators seem to have been alike in the dark, or else careless of the rights of their constituents. It is known that the assessment of real estate is grossly unequal, between owners and between localities. The assessment of personal property, except in agricultural communities (where it approaches honesty), is so unjust and so inadequate as to be a mere farce; while the owner of credits, better able, perhaps, than all the others to pay, escapes almost entirely.

REAL ESTATE FOLLY.

The average assessed value of real estate in Wisconsin for 1884 was, upon lands, 54 per cent. upon actual sales of same lands, and upon city lots 60 per cent. Upon the same basis the following were the percentages of assessments to actual sales in 1884 in the counties named:

Bayfield	on lands, 73;	on lots, 46
Calumet	on lands, 60;	on lots, 40
Clark	on lands, 29;	on lots, 41
Columbia	on lands, 61;	on lots, 56
Douglas	on lands, 96;	on lots, 91
Dane	on lands, 50;	on lots, 59
Eau Claire	on lands, 69;	on lots, 96
Florence	on lands, 25;	on lots, 64
Green	on lands, 45;	on lots, 57
Iowa	on lands, 45;	on lots, 73

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Jefferson	on lands, 36;	on lots, 50
Kenosha	on lands, 60;	on lots, 45
La Crosse	on lands, 46;	on lots, 42
Milwaukee	on lands, 56;	on lots, 66
Oconto	on lands, 39;	on lots, 97
Pepin	on lands, 53;	on lots, 64
Pierce	on lands, 47;	on lots, 63
Polk	on lands, 53;	on lots, 40
Portage	on lands, 34;	on lots, 52
Price	on lands, 56;	on lots, 38
Richland	on lands, 45;	on lots, 62
Sawyer	on lands, 42;	on lots, 62
Sheboygan	on lands, 58;	on lots, 46
Waushara	on lands, 59;	on lots, 41
Winnebago	on lands, 73;	on lots, 70

Thus, under the system of "how not to do it," it appears that, upon comparison of actual sales, lands were assessed for taxation all the way from 96 per cent. in Douglas county to 25 in Florence county; and city lots from 97 per cent. in Oconto county to 38 in Price county. To the eye of intelligent men and legislators could anything appear more farcical than this, as a basis of enforcing equal taxes upon equal values? Is this the best the people's agents can do to apportion the burdens of government upon them? Then, indeed, is the constitutional rule of *uniformity* a "barren ideality." Perfection in valuation is not expected, but it may be very nearly approximated. No excuse, even plausible, can be urged for the failure to assess real estate at near its true value. Actual sales are the best criterion for that sold. The remainder should conform to these sales as near as human judgment can accomplish it.

PERSONAL PROPERTY FARCE.

As to personal property the record is worse, as might be expected. The average assessed value of horses in Sawyer county was $86.44, in Monroe county, $30.41; of neat cattle, in Sawyer county, $47.76, in Outagamie county, $7.70; of mules, in Bayfield county, *one mule*, $8, in Sawyer, $81.25; of sheep, in Ashland county, $2.32, in Marathon, $0.97;

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of swine, in Langlade county, $10.17, in Wood, $1.43; of wagons, carriages and sleighs, in Milwaukee county, $46.88, in Buffalo county, $9.39; of watches, in Bayfield county, $32.18, in Vernon $8.37, of pianos, organs and melodeons, in Milwaukee county, $146.33, in Adams, $17.91. Comment on such a showing is useless. It speaks for itself. The solitary $8 mule of Bayfield would raise his derisive voice at sight of it! The assessors of Dane county, also make startling disclosures. As a matter of statistics they report 21,432 milch cows, worth $1,780,079, while for assessment these same cows, and 35,352 neat cattle in addition, they only assess at $895,186. The same assessors, under equal oath, reporting the cattle in one instance worth $25 each, and in the other $83 each. Truly, the flexibility of the assessor's oath is quite remarkable. If the numerous assessors are to be admitted into that torrid realm of doubtful authenticity, as they certainly must be, I can't see how there can be room for a mere common sinner.

BANK STOCK BURLESQUE.

The valuation of bank stock, all presumably worth par or upwards, exhibits also, a wide divergence from equality. The following is a statement of the taxable bank stock at par, its valuation by the assessors and the percentage of assessed to par value in the counties named:

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COUNTIES.	PAR VALUE.	ASSESSED VALUE.	PER CENTUM.
Chippewa	$75,000	$43,500	.5800
Clark	50,000	22,400	.4480
Columbia	75,000	17,500	.2333
Dane	385,000	287,278	.7461
Douglas	60,000	30,000	.5000
Dunn	50,000	29,559	.5911
Eau Claire	130,000	116,605	.8969
Fond du Lac	250,000	68,684	.2787
Green	195,000	169,650	.8751
Iowa	50,000	8,500	.1700
Jefferson	295,000	177,460	.6015
Jackson	26,200	25,310	.9660
Kenosha	50,000	70,000	1.4000
La Crosse	350,000	211,670	.6048
La Fayette	84,000	16,700	.2061
Manitowoc	150,000	57,635	.3842
Marathon	160,000	157,400	.9837
Marinette	60,000	60,500	1.0083
Milwaukee	1,075,000	1,285,250	1.1958
Monroe	30,000	24,269	.8087
Outagamie	280,000	176,665	.6305
Oconto	60,000	350	.0580
Pepin	25,000	6,030	.2404
Portage	50,000	1,610	.0300
Pierce	35,000	None.	None.
Racine	550,000	517,900	.9416
Rock	527,000	412,385	.7824
Sauk	25,000	15,625	.6250
St. Croix	135,000	73,250	.5425
Shawano	30,000	14,305	.4765
Sheboygan	100,000	65,900	.6590
Walworth	325,000	204,502	.6292
Waukesha	150,000	233,940	1.5596
Waupaca	30,000	23,049	.7683
Winnebago	565,000	548,595	.9709
Wood	50,000	26,100	.5220
Total	$6,577,200	$5,141,073	Av'age .7816

This table is constructed from the most reliable data obtainable, and is substantially correct. The *elective assessor* furnished the basis for it. It exhibits a valuation all the way from zero in Pierce county, and three per cent. in Portage, to $1.1958 in Milwaukee county, and $1.55 in Waukesha. How is that for "equal and exact justice to all men?" The Pierce county bank reports a capital of $35,000 and surplus of $6,354; the Portage county bank a capital of $50,000 and surplus of $3,000. The official data do not show whether those bankers "cast an anchor to windward" with the as-

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sessor in the nature of a discount or overdraft! The Milwaukee and Waukesha bankers evidently omitted to do so. I venture that the Pierce and Portage assessors will be backed by the banks for re-election? But seriously, how do our present legislators admire the working of the assessment scheme of their predecessors? Can it be said that men represent the people, who do not invent a remedy for such iniquity?

MONEY AND CREDITS SIDESHOW.

Yet bad as is this official showing as to bank stock, it is historical and undeniable that the assessment of merchants' and manufacturers' stock, money, bonds, mortgages, credits and other personal property, all of which the law says shall be assessed at value, is infinitely worse. Statistics on this point are not readily obtainable, yet an exhibit of any personal property assessment roll in a village or city will confirm the truth of my statement to any intelligent mind. Indeed the experience of men is such that no proof is required to establish the fact of the gross injustice complained of.

UNIVERSAL DISHONESTY IN ASSESSMENTS.

The foregoing recitals may serve to refresh the mind and memory of the reader, but there is little that is new in them. It is known by all that there is no justice in the apportionment of taxes. Every individual property owner, whether it be of real or personal estate, seeks to get his property valued as low as possible, or to secrete it altogether if not notoriously visible. Every assessor strives to keep the property in his district as low or lower than that of his neighboring assessor. Every board of review and equalizing board, so-called, are actuated by the same purpose. Little or no attempt at honesty or fairness is expected anywhere along the line. To cheat the assessor is a virtue. To cheat your neighbor is no sin. To crowd an unequal burden on to some other town or county is most commendable. The assessor rather likes to be deceived. The property owner congratulates himself on his successful perjury, if he does not even boast of it, and so men of all ranks and conditions,

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from natural rogues to men of the highest honor in other matters, are rogues in common in the matter of assessment.

CAN PERSONAL PROPERTY BE REACHED?

The excuses offered for such a shameful state of things are quite remarkable. They are chiefly made by large owners of personal property, who desire to escape taxation. It is said that such property can not be reached by the assessor; that credits can not be discovered; that an effort to get at them would be inquisitorial, and that a free people would not endure it. Such absurdities, and others like unto them, so often uttered, have almost settled down in the public mind as truths. They are far from being such. Undoubtedly it is more convenient to assess and obtain taxes from real estate than from personal property, for "the soil is always there." It is this very doctrine of *convenience* that causes the trouble. Suppose it were necessary to obtain all revenues from personal property. Is it likely they would fall short? If the life of the state depended on raising the revenue in that way, would it be raised? Would the $5,000,000, or more, of personal property presumably possessed by Alexander Mitchell be permitted to escape assessment because it would be inquisitorial to compel him to show up, under oath, concerning it? And so of a thousand lesser Alexanders throughout the state.

Would bank stock be entered for taxation all the way from zero to one hundred and fifty-five above? And other personalty for little or nothing? Would the perjury of assessors and property owners be a mere joke and matter of course as now? Would one owner of personalty permit himself to be fairly assessed, and his neighbor to escape with a light figure? Now, all are rogues alike. There is a community in their roguery which makes them emulate each other, and not condemn. It is most respectable to get the figures low! In the case supposed, however, it would be vital for all honest men, or those fully assessed, to see to it that all others within their knowledge were treated likewise. There would be a common interest for that purpose, as there now is concerning the valuation of real estate in

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particular localities. How easy it was for the United States to assess and collect the income tax during the war. Although odious, it was a most righteous tax. It was inquisitorial. But what of it? It was assessed and collected with a success equal to any tax ever levied, and with little fraud on the part of the people assessed. There was, first, a strong law passed, a law intended to be executed; then a commissioner of internal revenue — one strong, intelligent head at Washington — to appoint his deputies, prepare instructions, and see that they were observed everywhere alike. There was no nonsense about the execution of that law. Neither the deputies nor the people dare disobey it, because it was made to be executed, as all revenue laws should be. So it would be in Wisconsin, if we were obliged to collect our taxes all from personal property. We would then devise such machinery as would effectually accomplish the purpose, be it inquisitorial or otherwise. The idea that it cannot be done is the height of nonsense and cowardice.

WHY SUBMIT TO INJUSTICE?

But we are not obliged to raise the revenue all from personal property. We determined long ago to raise it from real and personal alike. Then why do we not do it? Why do the farmers, who pay heavily on real estate and personal property too, and other real estate holders, sit quietly from year to year under the enormous injustice habitually inflicted upon them. They would have the absolute control of the matter if they have the intelligence and courage to use their strength. Upon an honest assessment, their taxes would be little more than one half what they are now. The difference is millions in the aggregate and well worth saving. Then there would be immense satisfaction in compelling those to pay who ought, but who have escaped these many years. I believe all good men would hail the day.

INQUISITORIAL ASSESSMENTS CONSIDERED.

By law, banks, railroad companies, insurance companies, and some others, are annually subjected to the inquisitorial process, and required to make sworn returns of their prop-

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erty and income so that their contributions to the revenue may be fixed. Merchants and manufacturers, private and corporate, seeking credit, as most of them do, must frequently exhibit the tenor of their balance sheets to those with whom they deal, and to the mercantile agencies, otherwise they will not be trusted. Such statements are made cheerfully and as a matter of course. Their financial condition is no secret. Anybody interested can ascertain from the agencies by the asking. The farmer can scarcely buy a reaper or a thresher without making a complete written property statement to the inquisitorial agent. The farmer seldom kicks about it. Are the public through their assessor, less entitled to the facts? Should the citizen, so rich that he needs no credit, and therefore needs to make no voluntary showing, be more favored than his less fortunate neighbor, merely because it would be inquisitorial to make him disclose? "On what meat doth this our Cæsar feed, that he is grown so great?" Must the assessment law be so administered as to make the rich richer and the poor poorer? Must the freemen of Wisconsin continue to make obeisance to the moneybags? Is it right to require taxes from each according to his wealth? The law answers, yes. Common honesty answers likewise. Then let it be done, say I, and I trust the legislative acquiescence will so reply.

THE DIFFICULTIES.

That there are difficulties in the way, and obstacles to surmount, should only nerve the intelligent legislator to overcome and surmount them, for they are easily disposed of. Let it not be said that the fair obligations of citizens to the state, and to one another, in the matter of assessments, cannot be established by a law, and that law executed to a great degree of perfection. Heretofore, legislators seem to have been abashed by the apparent difficulties, or else have been interested themselves to consider such insurmountable. I trust that day is passed. It is also objected that, since the state tax to be apportioned to the counties is now so small, it is well enough to let each county arrange its own valuations to suit itself. Is legislation for the state alone, or for

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the counties and towns, and the people, as well? The state tax has seldom been burdensome. It is the county and municipal taxes that need the boon of an honest division between the tax-payers, according to wealth. The objection, rightly considered, is without force. Another idea advanced in opposition is, that men own, usually, about as much of personal property as of real, and if they pay a double tax on one sort, and none on the other, the figure is about right. There would be force in this objection, if true. But it is not true. Observation teaches us that men in general, especially in cities, make their investments largely in one or the other kind of property. The merchant deals in personal property almost exclusively. The capitalist in money, bonds, mortgages and stocks. Millions of such property are held by men who do not own a foot of real estate, unless it may be their homestead. This kind of property is sought after by the close-fisted capitalist for the very reason that it is not usually taxed, and to escape his share of the burdens of government. It is said that, being taxed, he would charge more for his money, and the borrower must pay it. In the past that would have been in some measure true. But the time has gone by when usurers flourish in this country. With them it is now, not how much shall we charge, but how much can we get for our money? The people are not borrowing, but rather lending. It is difficult to get compensating interest at all. Money does not command as of old. And so the objection is reduced to this: "Your theory is right, but the experience of years has demonstrated that it cannot be enforced." I deny it. It has not been enforced. That is true. The reason is that it has never been honestly attempted.

THE REMEDY.

The remedy I would commend for these evils is this: Let the secretary of the state or state treasurer be *ex officio* state assessor, or better, perhaps, create a new office. Let the state assessor have complete control of all property assessments in the state and be responsible therefor, appointing such county and district assessors as might be found necessary to properly do the work, with power to remove them

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at will. The appointments should be non-partisan and for peculiar fitness only. The state and county assessors should continue their work during the entire year. The deputies should serve only when called upon by the county assessor. All should be governed by instructions from the state assessor, which should be uniform throughout the state. Special deputies should be employed, when needed, to visit every county and inspect and direct the valuations of the work according to the instructions of the state assessor, and report all derelictions and offenses. Assessments should be at their fair value. The assessor and deputies should require sworn statements from each property owner as to personal property of every kind, and should cross-examine the party and call witnesses in respect to such statements, and compell their attendance and production of books when desired. Equalization boards and boards of review would be useless and should be abolished. Penalties should be provided against fraud, perjury or concealment by the assessor or property owner. Persons refusing to make a sworn statement should be imprisoned. A change in the machinery of the present law, as above contemplated, would, I am persuaded, work a thorough reform in the whole matter of assessments and secure approximate equity between all persons and localities.

SUPERIORITY OF SYSTEM PROPOSED.

Now in what respect would the suggested system be superior to the present, both professing to accomplish the same thing.

First. It would secure the strong central mind and control over the whole subject, and instructions which would be obeyed in every part of the state alike, by the county assessors and deputies, on pain of removal. The directing mind of the state assessor would be thus everywhere present. There would soon become a pride of truth and honesty, instead of a fashion of fraud and perjury. The state assessor would, for instance, see that the bank stock and cows in one part of the state were valued the same according to worth as cows and bank stock in another, and all other

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property according to its most easily estimable value — what it is worth. He would occupy the same relation to the business of assessment as the general manager of a large railway corporation does to its practical operation, or that the head of an extensive mercantile house does to its complex affairs and dealings in all parts of the world. Whoever heard such a man say "can't?" He could have no motive but the success of the scheme and the applause of the people. The roll, when completed, would represent the true wealth of the state, and not one fraction in one locality, another fraction in another, with guess-work and perjury pervading the whole.

Second. The time now allowed for assessing property is from May 1st to July 1st, or thereabouts. The short period of two months would seem to have been fixed on purpose to permit the assessor to guess at the real estate and skip the personal property at will. There is no necessity for such a limit, as there is no propriety. No assessor can do justice to his roll in so short a time. The county assessor, under the plan proposed, remaining at his work through the year, with such deputies as he might need, would be continually investigating and discovering taxable property. devising methods for successful work and accomplishing it.

Third. With the present system of elective assessors, an honest assessment is to much too ask of poor human nature. "Will a duck swim?" Will an assessor, seeking votes for a re-election, take the utmost pains to discover the property of the man whose vote he wants, or properly value it when discovered? Will he keep the valuations in his town, where they belong, or try to get them as low or lower than his neighbors? Will he keep his oath like a man, or perjure himself like an assessor? History and experience answer all these questions. The fact that real estate in Wisconsin is only assessed on the average at 60 per cent. of its actual selling value, also answers them. That such assessments in different counties range from 25 to 97 per cent. also answers them. That bank stock ranges from nothing to 155 per cent., also answers them. In short, the questions answer

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themselves. Honesty in assessors now-a-days is not fashionable, and who would be out of fashion? Let the assessors be appointed, as suggested, and be responsible alone to the state assessor, and he to the people who elect him. Such a course within a year or two would revolutionize the whole business, render honesty the rule, and roguery a punishable exception.

Fourth. The expense would not be greater, if indeed so great, as at present. The county assessor, with one deputy, at work through the year, would be able to do the work well in most counties. In others more deputies would be needed, especially for personal property work. Yet expense should not be spared to any extent needed in so important a work.

Fifth. The dishonesty now so prevalent and so fashionable, in the matter of assessments, is occasioned by every man's knowledge that every other man is alike dishonest with the state. Property owners in general despise dishonesty. Did they not in the main, they would not be property holders. I believe that nine tenths of them would be glad to list all their property at value, if certain that substantially all others would do the same. I have alluded to Alexander Mitchell as possessed of large personal estate liable to taxation, which now escapes. I know nothing of his possessions or whether he has any that escape the assessor. I mention him only as the leading capitalist of Wisconsin, whom I know to be both honest and wise as well. Honest, to pay his fair share of taxes as matters run in Milwaukee. Wise, not to schedule his personalty at value and become a laughing stock among his neighbors. He is merely a bright type in the capitalist font. But he is reputed as honorable as he is wealthy, and if the execution of the laws were such that capitalists were voluntarily giving in their property fairly for assessment, or would be compelled to if they did not, I doubt not he would cheerfully set the example of such integrity, else his reputation belies him. And so would nearly all others who now habitually resort to concealment or worse. The rest should be made to. There is

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a certain patriotic pride and satisfaction in doing one's share for the public advantage, as there is a corresponding reluctance to doing more. Under the proposed system, after a time, the sneaks and rogues would be whipped in by the lash of honest men. One cannot long conceal his ownership of much property, either as to kind or amount. The assessor, so disposed, will soon catch the facts.

CRY OF THE CROAKER.

Somebody will be sure to say, "To appoint assessors and not to elect them is contrary to the genius of American institutions." "Are not a free people capable of self-government?" "Should we have an official aristocracy?" "Can't we pick out a man in our own town who can assess our property better than a man who might be selected by the county assessor?" "The people of 'my deestrick' are not complaining." "They are satisfied to let well enough alone. They want no new-fangled schemes." And much more familiar ejaculation born of ignorance or self-interest is sure to be heard. The legislature is alone responsible for the existing enormities. What are they going to do about it? They understand the situation fully in their hearts. Have they the courage, the patriotism and the patience to apply the simple remedy? Some say the town elective assessors can be relied on if a proper head were placed in charge of them. It is not possible. Two hundred years of experience in this country, and almost forty years in Wisconsin, prove the contrary. The reform to be worth anything should be radical. Who but the rogue can be in love with the elective assessor? Who but the tax sneak can favor a system born and executed in dishonesty? Why did not the United States have the town assessors handle the income tax? Why did not they let the people of each locality elect a man to assess that tax? Why? Because congress wanted the tax honestly assessed and collected. And it was so. Why has the Wisconsin legislature heretofore declined to appoint efficient machinery to assess and collect our taxes? Why? Because they did not want them honestly assessed. Will your honorable body follow in the course of sloth, indifference or

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iniquity pursued by the men who have hitherto held your places? Or, as you have now the opportunity, will you be of some really valuable service to the great body of citizens who elected you?

EFFECT OF PROPOSED SCHEME.

The assessed value of all property in Wisconsin last year was $487,950,036. The total tax assessed thereon was $9,985,292.80. The average tax was a shade less than two and one-half per cent. The valuation of real estate was $378,853,864. Of personal property, $109,096,472. I am of the opinion that the personal property in a thriving, well-settled state like Wisconsin, nearly equals the value of the real estate. The real estate is now assessed at 60 per cent., its true value being $638,583,108. The personal property is valued now at $109,096,472. This figure, upon the true value of personalty, including that which escapes entirely, does not exceed 20 per cent. I doubt if it exceeds 15 per cent. But at 20, the true value of personal property in the state is $545,482,310. Total of real and personal, $1,184,065,418. On this valuation, the tax of last year would have been eight and a half mills instead of two and a half cents. Now the suggestions I have made, if reduced to statute, would be to raise our assessment rolls nearly three times. Owners of real estate would pay $638, where the owners of personalty would pay $545. At present they pay $379 and $109, respectively.

"UP GUARDS, AND AT THEM!"

Is such a consummation desirable? If so, it can be effected if the legislative will so determine. If so, awake from your lethargy and go about it. It may be difficult. So is anything worth achieving. "Is the route possible?" asked Napoleon at the foot of the Alps. "Perhaps," responded the engineer. "*Forward, then,*" was the energetic response. Is it just? Is it right? Then let it be accomplished. But remember, it cannot be done under the go-as-you please system so long in vogue. As the dog will lick the hand that feeds him, so will your local elective assessor

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"crook the pregnant hinges of the knee that thrift may follow fawning."

SHALL THE LAMBS CONTINUE TO BE SHORN?

Or will the farmer and the land owner, and their representatives in the legislature, whether from city, from regions of cultivated fields, or from the unproductive but taxable wilderness of the north, continue to repose in the belief that a remedy is not attainable, and that the owner of personal property, however great his hoard, is too much a gentleman to be asked any questions about it, and has better and fitter uses for his money than a just contribution to the state.

You have happily elected your senator. You will have your feelings all torn up as to whether your constituents will get too little whisky or too much; whether a high license will reduce the size of tumblers, or a low one keep them too large. But you have no vexatious Kilbourn dam, no Dells bill, no granger law or other matter of magnitude to require your attention. I pray you to go about it in earnest and place among the laws of Wisconsin an enactment that will be of more practical importance to your constituents at large than all others now found within the ponderous volume of the Revised Statutes.

Akin to this subject is the matter of Railway Licenses, which I had intended to discuss here, but am unable to do so for want of the figures in the Railroad Commissioner's report, not yet in print. I am persuaded that the iniquity involved in railroad licenses is scarcely less than the others I have herein referred to. If upon investigation I find it so, I crave your attention anew to that subject.

Mr. Hinton — I will say this: that Alexander Mitchell, one year, paid more taxes than the whole town of Milwaukee.

Mr. Broughton — The true principle of the burdens of government is equal pay and equal privileges, equal burdens and equal benefits, but unfortunately, this matter of assessment in taxation, like the swamp lands and the drainage fund, is in the fog and morass, and echo says from the paper

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that it is a wrong that ought to be righted, but the whole system now as in the past, has been a system to scientifically divert the hard earnings of the industrial man into the pockets of his oppressors.

Mr. Hinton — I don't know whether it is in accordance with the rules or whether it will be permissible, but, as I understand it, all these papers will be published by the Agricultural Society, I would suggest that the paper which the gentleman has just read, if deemed advisable by you gentlemen controlling the matter, be published at once, (Motion seconded), and that every member of the legislature be supplied with a copy at once, and in addition to that, these gentlemen assembled here, and ladies also, tender a vote of the heartiest thanks to this gentleman for one of the ablest papers ever read before this society, embracing more and giving more correct ideas upon the intricate system of taxation and the frauds, forgeries and perjuries that have been committed, than any paper I have ever listened to. (Applause.)

Mr. Arnold.—Do you mean to compel the agricultural society to publish it at once? Who will foot the bills?

Mr. Hinton.—I will contribute a little toward it now.

Mr. Tenney.— I would like to have the gentleman's motion prevail. I will see that the expense will not bother you any.

Mr. Hinton.—Mr. Tenney, I understand, says that the society will not be put to any expense, but if Mr. Tenney gets this paper published and this society backs it up, I think it will help him.

President Arnold.—The question is, as I understand it, that this convention indorse the paper and recommend its immediate publication, and that each member of the legislature be supplied with a copy as early as possible.

Mr. Ford.—As I understand Mr. Tenney it is to be an appointive sytem throughout from the central authority.

Mr. Tenney.—All except the state assessor.

Mr. Ford.—I understand his plan would be that all the assessors be appointed by this central assessor,—that the

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county and town assessors be appointed. Now then I wish to suggest: our present system is constructed on the democratic plan, that the people of the localities are the best judges of their own affairs and of the value of their property. I want to ask him what assurance he would have that these appointed assessors would be the best judges of the relative value of real and personal property in the several localities, or if they should be incompetent or dishonest or subject to bribery, what method he would have to detect them. As I understand, there is no board of equalization that can review them, and no local board. Might it not be open to some objection on that account?

Mr. Hinton — Mr. Tenney puts it on the plan adopted by the United States.

Mr. Tenney — The proof of the pudding is in the eating. Look at what our assessors, selected by the people throughout the state, have done. See what valuations they produce It needs no argument, but any intelligent man who knows how property is valued ought to know that each assessor is morally committed to each individual in his district to keep all the property in that district down with other towns. How are you going to remedy that? Put a state assessor there who will turn this man out of his place if it is discovered that he is not assessing property according to value. The local assessor might be a local man of course, selected in his own county.

Mr. Ford — But who will discover that?

Mr. Tenney — Detectives and deputies who go around from time to time and look this thing up.

Mr. Owen — I believe I can answer the question of Mr. Ford. In the country where I was brought up all the assessors are appointed as I understand it. I was twenty years old when I came away from there. There was an assessor appointed by the government for each county, and when he made his valuation against any man in the county he gave a copy of the valuation he made, and gave notice of a time to be heard if it was too low or too high. The man had a

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chance to appeal right there and be heard and bring his witnesses if necessary.

Mr. Ford — I am not opposing this thing. I am simply raising questions about it. I want to say this, that we have a system as perfect as Mr. Tenney's, except as to the change from the elective to the appointive system. An opportunity is given the assessor to put the thumb screws on and investigate by our present law. The only question is how to get it done properly. I do not oppose Mr. Tenney's system, but the matter of raising taxes is the most difficult thing in government.

Mr. Williams — Suppose this thing was to be controlled by the state, those men to go through a locality and they do not understand the property and the location of it. Let every town appoint its own officers.

A Member — Have not we got men in the legislature that have brains? We cannot get an honest man. He has got to be a railroad man or a monopolist.

Mr. Austin — I think that we all realize the fact that the evils mentioned in the paper exist. I think that we all feel that there ought to be a remedy. We are not a legislative body. I do not think it is our particular duty, and if it was, we do not have the time in the three or four days of our convention here to make organic laws, to build colleges and provide for all these things, but we can send up to the room above us our ideas, and I believe the expression of this convention ought to go forth, that it is the sense of this convention that the evils mentioned in that paper exist, and that the legislators ought to set themselves to work and fix it so that men who would be honest can stand up and face the assessor, and, after he has gone away, not feel that they have had to lie to him to protect themselves against those who make it their study and their business to conceal their property to keep it from taxation. It does not increase the burden of taxation one cent to have the property assessed at its true value, provided it is done throughout the entire state. The reading of the assessments made by the assessors in the different counties of the state shows that they are either in-

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competent or willfully criminal, and that a remedy is demanded. I move you that it is the sense of this convention that the evils exist, and that the legislature should, at the earliest possible moment, remove the difficulties and make an honest assessment possible.

Mr. D. R. W. Williams — I am in favor of the principle adopted in this state of elections, so far as possible, of the officers of the state, down to the lowest offices; and I believe the correction of this matter can be better made by the agitation of the question among the people, and when they see the evil they will correct it among themselves. If this resolution was to be adopted, I would move that we amend the constitution and let the governor have power to appoint all the officers in the state.

Mr. Broughton — Do you propose to keep it where it is now, in the realm of party politics ?

Mr. Williams — I believe the people can correct this evil with the law as it is.

Mr. Broughton — We do not live to be as old as Methusalah.

Mr. Williams — But the people will live as long as that.

Mr. Cox, of Juneau county — I have had some experɔɔuɐɪ in this, as I have been an assessor. I tried to do my duty, but I could not do it. Conscientiously there is no possible way. Every evil spoken of in that paper exists, and I know it. We have discussed it in our farmers' clubs, granges and other places, but the remedy we have never been able to agree upon, and this convention cannot agree upon the remedy. We can approve the principle laid down there and leave it with the legislature to apply it if they can.

Mr. Ford — What is the trouble that you cannot do your duty?

Mr. Cox — If we attempt to assess property at its actual value we kick ourselves out of office in a moment.

Mr. Cook, of Westport — Mr. Tenney, in the course of his remarks, spoke as if a man that held the office of assessor would run for re-election. It may be so in other parts of the state. In our town it is with great difficulty we can get any

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man to take that office, for the reason that, if he does his duty, everyone will be looking down on him, for the reason that they will say that he is favoring this man and that, and doing what he has no business to do under our present law.

Mr. Arnold — I understand the object of the motion is that we indorse the sentiment of reform in assessment. Is that the object of the motion.

Mr. Austin — That is the object of the motion I made.

Mr. Fritz Elver, of Middleton — It seems to me there is one good point in this paper that has not had any attention paid to it, that is the time of the year. I have been somewhat in town offices, and I notice that a great many men will get rid of their property by the first of May. They put their property out of their hands. They sell it and dispose of it, and by the first of August they have it again. I think there is a big advantage in having the assessors all the year around, so that men can not get rid of their property.

Mr. Goodrich — As a body of farmers, I believe it is a grave mistake for us to attempt to delegate to an appointing power the assessment of property. I believe we cannot expect an honester administration from men who, by hook or by crook, aspire to a chief office than we can from the people themselves. The evil is a grave one, but let the remedy come from the people. That is the sentiment of a farmer who has lived in Wisconsin 45 years.

Mr. Warner — Listening to the remarks in regard to this theory of taxation, I will say that it presents many features, some plausible, and some objectionable. The remedy is sought, in my opinion, in an objectionable way. We do not want to surrender these rights and privileges which have been conceded to us as individuals owning property, to have appointees put over us to assess our individual property. We are capable of selecting men from our immediate vicinities that are just as well endowed with honesty as any man that you will find anywhere, and the law has provided that if an assessor violates his obligation there is a remedy. Prosecute him for the neglect of his duty. The only means

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of insisting that any appointee shall do his duty is to punish him for the violation of that duty. And I ask the question, where will you find men honest enough, having been convicted, as they have been by the gentleman reading the paper? The officers that have been put before the public as assessors are criminated by him as having violated their obligations and oaths and perjured themselves. Where are you going to select honest men to come before the public and do the work which these have attempted to do, when it is said they are all dishonest? Where are you going to get the men to remedy the evil? They are all branded alike as being dishonest and perjured. With the knowledge that the evils exists, it can be remedied among the people by holding men to their sworn obligations when they undertake to perform public duties.

Mr. Ford — The proposition introduced by Mr. Tenney is a very grave one. It proposes one of the most radical changes in our form of government that has ever been proposed. I respect Mr. Tenney's ability, and the boldness and originality of his conception. I do not know but what we shall come to it, but I have this to say, that this society does not wish to throw away its influence by rushing on to a measure which they have not fully and thoughtfully considered. If this society is going to have any influence with the state legislature, or the people of the state, it is because it considers these measures fairly and fully, and knows what it is about, and then moves surely. The memorial that Mr. Tenney will present to the legislature, who are elected for that express purpose, is a little aside from our business.

Mr. Hinton — All I asked was that it should be printed and presented to the legislature for their consideration.

Mr. Ford — I understand that the indorsement of this society is asked for that resolution.

Mr. Hinton — No such motion has been made. The motion was that we were in favor of having this printed. Then it was found that the society did not want to go to that expense. Mr. Tenney said that there would be no expense, as I understood it. The object of the motion was

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that each member of the legislature be presented with a printed copy of the paper which Mr. Tenney had read for their consideration.

Mr. Ford — It is a concession then that this action is all superfluous, that this society does not indorse the motion; that this society does not pay for the printing, that the memorial will be printed by Mr. Tenney at his own expense and present it to the legislature. Now if they do not ask for the indorsement of this society they ask for nothing and we are fooling away our time.

Mr. Hinton — Are we fooling away our time by calling the attention of the legislature to an important subject which touches every man, woman and child in the state, and simply asking that they shall have the advantage of reading and studying the ideas of an exceedingly able paper? Does the gentleman want to put this convention on that level?

Mr. Ford — No, I do not consider it so.

Mr. Morgan moved to amend by adding that the proposition of Mr. Tenney and his recommendation receive their serious consideration.

Mr. Ford — Is not that a qualified indorsement of the proposition?

Mr. Hinton — Not at all. No indorsement is asked for whatever.

Mr. Tenney — I will briefly reply to my friend on the right. He asks me where we will find men to honestly administer the assessment law. The state assessor, having control of the whole matter, will very likely appoint the identical men who have heretofore done the business throughout the state; men familiar with the assessment business, but they will have him behind them to say: "You must make this thing uniform throughout the state. We want an honest assessment. You must make your assessment honest in your town or county. If you do not, I will cut off your head." And these same men will do the work under that direction, but when they know they are under obligations to Tom, Dick and Harry, they will not do it, and the proof is, they never have. Perhaps you do not know my friend, Mr. Ford, as well as I do. He is inclined to have

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this thing sat down upon by this society. It is quite competent for the society to sit down upon it if they wish to. I wish to tell you that he is one of these men, unless his reputation belies him, whom this bill is designed to affect. Common repute attributes to him a great many thousand dollars of securities which escape taxation. He is also a large taxpayer on land, and I think his idea is that it might affect him.

A member rose to a point of order that the remarks were of a personal character.

Mr. Tenney — Not at all, only I wanted to explain to this house where the opposition was. Of course every man who has a large amount of personal property does not want to be assessed, especially if it is mortgages, but we ought to do it just the same. That is the animus of the opposition from that quarter.

Mr. Ford — I wish I could plead guilty to the personal charge the gentlemen has made, but I must say, for the last five years I have been so free from mortgages that I am nearly dead broke, and I am willing that all the assessors of the state should come to me and put me on oath.

Mr. Broughton — If I were running the race of popularity and wished to flatter the people in order to befog and befool them, I should stick to the elective system and say, "My good fellows, you have all in your own hands."

The motion to amend by adding that the proposition of Mr. Tenney should receive serious consideration, was then put and carried.

The motion of Mr. Hinton, that when the paper was printed it was the wish of this meeting that every member of the legislature should be supplied with a copy, and his attention called to it for consideration, was then stated by the chair, and upon a vote being taken was declared lost.

Mr. Ford — A bill has just passed the senate in conformity, as I understand it, with the recommendation of the regents of the university to appropriate the sum of $5,000 for the expense of experiment stations and lectures in different parts of this state in the interests of the agricultural department. There is no provision, as I understand it, except, "under the

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direction of the regents" as to the time or the location of those meetings. Many of our members think that this society, or its officers, should have something to say about the time and place of holding those meetings, and how they shall be conducted. That is a matter that I wish to bring before you, and I present this resolution:

Resolved, That it is the sense of the convention that the bill be so amended, if it passes, that we, the State Agricultural Society, may be in some way represented on the board that may have the power of appointing the place and time of holding these meetings and the persons to address the convention.

Mr. Broughton — As representing in part the grangers of the state of Wisconsin, I would say that they do not wish to put their grange halls and all those things under the direction of the regents of the state university.

Mr. J. M. Smith — I read that bill very carefully yesterday afternoon, and if it passes the authority to appoint and call upon these men would naturally go to the agricultural committee of the board of regents. That committee consists of Hiram Smith of Sheboygan Falls, Mr. Hitt of Fond du Lac, and Mr. Williams of Baraboo, gentlemen that we are all well acquainted with, and that we all trust. The State Agricultural Society ought to have something to do with it, and I would move that the name of the president of the State Agricultural Society be added to the list. That would give the society a voice.

Mr. Broughton — Unfortunately we have had some experience in that direction. This farmers' committee in the board of regents is sunk in the majority, and one member representing the State Agricultural Society will be insufficient to change the present state of things, consequently the grangers must conclude that that is a scientific trick to befool them.

Secretary Babbitt — I move that this be left to the board, and also that it include a representative of the grangers' association. These meetings must be held in grange halls, as a general thing, in order to get at the farmers. Now we want to treat the grangers honestly and fairly. I am not a granger, but at the same time I never have been out among

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the farmers of this state yet, and I have been out a great many times, when I have addressed them in any other place than in a grange hall, with the exception of one church.

Mr. Wood — I will call Mr. Babbitt's attention to the fact that in Baraboo the agricultural meetings are held in the court house, and not in the private hall of any secret society.

Mr. Babbitt — I am not particular. All we want is to get as near the people as we can.

Mr. Arnold — I can easily see by reading that bill that it is possible for this five thousand dollars, that is being appropriated for the purpose of instructing the farmers of the state, to tend only to the advantage of professors in the university.

Mr. Ford — How would it do to have that resolution so amended that the bill should provide that the committee on agriculture of the board of regents, the president of the State Agricultural Society and the head man of the State Grange be the men who shall set the times and the persons to make these speeches?

President Arnold — The motion of Mr. Ford is to amend the resolutions so that we shall desire the legislature to amend their bill, providing that the committee on agriculture, composed of the board of regents, the master of the State Grange and the presidents of the Wisconsin State Agricultural Society and of the State Horticultural Society, be the officers to indicate the time and place of holding these meetings, and to indicate the names of the speakers.

Mr. Broughton — The grangers have just as good a right to be jealous of their prerogatives as any other class, and it looks like a trap to put the wet blanket on them yet. It makes it even, you might call it, but even sometimes turns out to be odd.

Mr. Ford — What is the practice in Ohio under a similar law?

Mr. Babbitt — They are run by W. W. Chamberlain, the secretary of the Ohio Agricultural Society. As far as I am concerned, I would like to be relieved of the matter.

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Mr. Broughton — Everything ought to go according to Darwin, by natural selection.

The amendment was then voted upon and carried, and the resolution, as amended, unanimously adopted.

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WISCONSIN

State Bee-Keepers' Association.

Pursuant to a call published in the *American Bee Journal* and other papers, a goodly number, forty-two (42), met in the Agricultural Rooms of the capitol, February 6th.

G. W. Sanford, of Dane county, was called to the chair as temporary chairman, and on motion J. W. Vance was elected secretary.

A committee of three was chosen to nominate permanent officers, which reported

C. A. Hatch, of Richland county, President.

George Grim, of Jefferson county, 1st Vice-President.

R. A. Morgan, of Columbia county, 2d Vice-President.

Frank McHay, of Juneau county, Treasurer.

J. W. Vance, of Dane county, Secretary.

On motion the report of the committee was adopted.

The constitution and by-laws as contained in Newman's Bee-Keepers' Convention Hand Book was read, and on filling the blanks, was unanimously adopted.

Twenty-two came forward, signed the constitution and paid the fee.

On motion a committee was appointed to prepare a programme for discussion. After some deliberation the committee reported the following topics:

1st. The best system of comb honey, A. E. Joiner and F. Wilcox to lead in the discussion.

2d. Controlling after swarms, F. McHay to lead.

3d. Races of bees. M. A. Gill to lead.

4th. Best mode of wintering. C. A. Hatch to lead.

Mr. Joiner opened the discussion upon the first topic. He

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said he thought comb honey ought to be made a specialty. He began with with box hives. He afterwards took to using the patent hive, and at first run for extracted honey. He considered the use of foundation essential both for the long comb as well as for starters in the section boxes. The shape of the hive is not so important as the situation of the flowers accessible to the bees or the method of management.

I keep about thirty colonies of bees. Have about three hundred extra combs; use the broad frames for sections, six frames for each super, examine from time to time and remove all filled sections. The short, or as I term them, "bob-tailed" sections. I leave and allow the bees in the spring to have access to the hives containing these sections when the bees clean them out.

I like the hybrids. A cross bee will always take care of its honey. Some of the best bees are the commonest stock. Black bees are hard to find now.

Mr. Wilcox said the notice that he must speak upon this topic was too brief to enable him to arrange his thoughts satisfactorily. He would say in regard to the best system of honey comb was not what he had done but what he thought was the best and what he intended to follow hereafter.

He had adopted the simplicity hive. It was not in his opinion perfect but had its advantages and disadvantages. It is adapted to both comb and extracted honey. He does not use broad frames. The hive he expects to use hereafter is the Heddon Longstroth hive, and follow the Heddon system. Shall use sections $1\frac{3}{4}$ inches wide with a strip of foundation nearly the full size of the section, placing the foundation in the middle of the section frame.

Another system is the Byron Walker system. By that system your rack is ready to be shipped as soon as taken from the hive. I always tier up. It is especially of advantage in very warm weather. The Italians are the best for extracted honey.

Mr. McHay — If we use sections without separators we must use narrow sections, otherwise the bees will build extra combs. I raised about four thousand pounds; used some

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separators. After the bees get started in a section box I place another under it, and as soon as a section is filled I remove it.

[At this point the question arose, "How many use the broad frames?" It was found that only two bee-keepers present preferred the broad frames.]

Topic No. 2. Controlling after swarms. Mr. McHay—He had long ago found out that cutting out queen cells would not prevent swarming, particularly after swarming. He catches the swarm, places it upon the old stand, moves the old hive to a new stand, and the next day, in the evening, he brings the old colony and shakes all the bees into the new hive on the old stand, so that all the young queens are destroyed.

His first swarms appear about the 8th of June.

He thinks the German brown better than the black bee.

Mr. M. A. Gill practices the artificial mode of swarming, raises his queens as nearly as possible under the swarming impulse. He advocated the policy of having colonies strong at the right time to gather honey.

Mr. Wilcox hives back on the old stand, while whatever bees they have go right to work in the sections. He generally prevents another swarm and gets white honey.

Mr. McHay—A good deal depends upon the location of an apiary. Mr. Wilcox's location is very well for his plan. My location will not do on account of the bees getting too strong.

Mr. Gill had practiced artificial swarming so long that his bees have lost the nack of natural swarming. Has not had a natural swarm for three years.

Mr. McHay had last year an increase of only seven in an apiary of forty-five colonies.

Mr. Hatch explained the Heddon method which is familiar to the readers of this journal. He thought it very essential to keep good queens.

The next topic "Races of Bees" was opened by Mr. Gill. He said he had had experience with four races of bees. He likes the hybrid as a bee for business. Hybrids make it pretty hot sometimes. He wants bees for business. A dark

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cross gives the bee vigor. He said Mr. McHay is in error when he prefers the brown bee. The so-called brown bee is nothing more than the old German. The Italians have done the best for me. He procured a swarm from Mr. Birch which proved to be first rate bees. But as a rule I have found the best hybrids bred from pure mothers; if produced by Italian mothers crossed with the brown bee. They will protect their stores from robbers. The light colored bees I have found lazy. The dark leather colored bees have proved the best. Black bees do not protect their hives like the hybrids. The Italians are the worst robbers. If there is any honey they can get at, they are sure to get it.

It is difficult to distinguish a Holy land bee from an Italion, as far as looks are concerned. I have sometimes thought I could detect differences and again have found that bees in the same hive often show as much difference in regard to size, color, and general appearance.

The next and last topic discussed was, the best mode of wintering bees. Mr. President Hatch began by saying that it is a one sided question. He had tried without satisfactory success the out door plan, and was now of the opinion that a deep, dry well ventilated cellar is the best mode of wintering bees, not only because it is safer, but takes less honey. The bees ought to have twenty pounds of good thick honey; thickness of honey is an important quality. He does not look after the queens, he considers it unimportant, and it is a good deal of trouble to find them. He thinks it is a good idea to spread the frames. He keeps temperature of his cellar at about 45°, he considers that the right temperature.

Mr. Gill spoke of an instance where a bee keeper wintered his bees in the cellar under the kitchen floor and the bees were so warm they swarmed in February.

Mr. McHay gives plenty of ventilation at the bottom of the hive; sets the hives on strips giving a free circulation of air below. He considers this lower ventilation very essential to successful wintering.

President.—I must have bottom board.

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Mr. Gill.—I packed at first in corn fodder and lost all my bees but six colonies.

Mr. Joiner.—I have a pit dug in the hill side built around with saplings and covered and with a double door. At one end have a ventilating flue; set the hives in as soon as the weather sets in cold and leave them until April or when the maples are in bloom. I lose no colonies with this mode of wintering.

Dr. Vance described his double-walled hive in the construction of which he used building paper, three thicknesses, instead of chaff. He could not say as yet that it is a success because half of his bees died last winter, the most of the colonies evidently died from starvation. Thus far this winter his bees are alive.

Mr. Gill said if the doctor had set his hives in the cellar after his elaborate preparation no doubt they would have wintered successfully. In the cellar the bees require much less honey. One winter his bees were in confinement one hundred days and consumed but four pounds per colony. Twelve pounds are enough. Combs of honey are the best feeders. On another occasion he wintered one hundred and forty-five colonies on fifteen pounds of sugar syrup per colony.

Mr. McHay has a ventilating pipe from the cellar connecting with the pipe of the stove in the room above. He has had better success since he uses this arrangement.

Mr. Joiner thinks it will take as much honey as if wintering out-doors.

Mr. McHay — Bees do not breed much until spring.

Mr. Elvers thinks there are some advantages in out-door wintering, as the bees have brood earlier.

Mr. Gill thinks there is no advantage in having brood early. It was just as useless as it would be for a farmer to employ hands and board them for several weeks before the time of harvest.

Mr. Elvers said he sometimes did that with advantage. In setting out your bees from the cellar in the spring there is more or less dwindling which is not so apt to occur in out-door wintering. You will always find your bees materially diminished in a week after they are set out.

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The secretary of the State Agricultural Society, Clinton Babbitt, expressed his gratification at the success of the bee department of the society, and assured the members present of his interest in their behalf, and promised his cordial coöperation in helping forward the Wisconsin Beekeepers' Association.

Adjournment was now taken to next February.

J. W. VANCE,
Secretary W. B. A.

The following report was made at the Wisconsin State Beekeepers' Association, February 6th, 1885:

NAMES.	Number colonies last spring.	Number colonies in winter quarters.	Comb-honey.	Extracted honey.	Hive used.	Mode of wintering.
Antine Nelson....	6	10	.....	300	Simp.....	Cellar.
M. A. Gill	95	184	600	8,000	Simp.....	Cellar.
P. Nelson	13	34	.....	620	Simp.....	Cellar.
Franklin Wilcox.	15	165	6,000	500	S mp. and Lang	Cellar.
C. N. Smith.....	48	68	.....	4,100	Simp.....	Cellar.
Lewis Post.....	4	11	80	.....	Kidder.....	Cellar.
Lewis Miller	65	118	500	.....	Am.	Cellar.
R. L. Joiner	26	35	1,500	1,500	Simp.....	Pit.
Frank McHay	135	200	6,000	6,000	Lang.....	Cellar.
O. Grout	11	21	700	500	Lang.....	Cellar.
H. N. Herrick	10	16	50	600	Kidder	Cellar.
J. J. Race	32	80	1,500	.....	Lang.....	Bee-house.
J. McClay	28	32	.....	3,400	Am.	Chaff hives
D. Daniher.....	28	56	50	500	Kidder.....	Cellar.
J. W. Vance.....	8	13	.....	250	Simp.....	Dbl. walled hives.
C. A. Hatch	106	155	700	9,000	Lang.....	Cellar.
D. B. Hulbert	80	130	400	4,500	Lang.....	Cellar.
F. Elvers.....	41	58	500	3,500	Am.	Cellar.
C. Spangenberg...	15	15	.....	1,400	Lang.....	Chaff hives
C. H. Hall.....	1	4	.....	.....	Simp.....	Chaff packed.
G. W. Sanford....	25	35	.....	3,000	Kidder	Cellar.
Totals.....	940	1,485	12,580	47,670		

Eight use the Simplicity hive.
Five use the Langstroth hive.
Four use the Kidder.
Three use the American hive.
Fourteen winter in cellars.
One winters in a bee-house.
One winters in a pit.
Four winter in chaff or double-walled hives.

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WISCONSIN SHORT HORN BREEDERS' ASSOCIATION.

At a meeting of breeders of Short Horn Cattle, held at the Capitol in Madison, Wis., Wednesday evening, February 4th, 1885, for the purpose of organizing a State Association, the following code of By-Laws was adopted by gentlemen present, as outlining the object of the Association, and the manner of conducting the business of the same:

BY-LAWS.

ARTICLE 1.—This organization shall be known as the Wisconsin Short Horn Breeders' Association.

ARTICLE 2.—Its object shall be to promote the interests of breeders of Short Horn Cattle within the State.

ARTICLE 3.—Any reputable breeder, or *other person interested*, may become a member of the Association by paying a fee of one dollar and having his name entered upon the roll of membership by the Secretary. Any member who may be found guilty of any unlawful or dishonorable conduct in his business as a breeder, may be expelled at any annual meeting by a three-fourths vote of the members present.

ARTICLE 4.—The annual dues of the Association shall be fifty cents, and no member in arrears for membership or dues shall be entitled to vote, but such annual dues may at any annual meeting be remitted by a two-thirds vote.

ARTICLE 5.—The officers of the Association shall consist of a President, two Vice-Presidents, a Secretary and Treasurer, and two other members, who, with the officers heretofore enumerated, shall constitute the Executive Board of the Association.

ARTICLE 6.—The officers of the Association shall be chosen at the annual meeting, for a term of one year, and shall continue in office until their successors are elected.

ARTICLE 7.—The President shall preside at all meetings of the Association.

The Vice-Presidents may preside at meetings of the Association in the absence of the President.

The Secretary and Treasurer shall keep a correct record of all meetins of the Association and the Executive Board, conduct the correspondence

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thereof, receive all money due such organization, have charge of the funds, and pay such bills as may be approved by the Executive Board.

He shall at each annual meeting submit a financial report, giving a detailed statement of all receipts and disbursements for the past year and the financial standing of the Association at that time.

The Executive Board shall have full management of the business affairs of the Association.

ARTICLE 8.—The annual meeting shall be held on Wednesday evening of the week of the State Fair, at the place where such fair may be held, under such arrangements as may be determined by the Executive Board. An adjourned meeting will be held each year at Madison, Wis., during the time of the State Agricultural Convention, for the discussion of matters pertaining to the interests of the Association.

ARTICLE 9.—These by-laws may be amended at any annual meeting by a two-thirds vote of members present.

The following officers were elected to serve until the annual meeting in September:

President.— A. A. Arnold, Galesville.
Vice-President.— G. E. Bryant, Madison.
Vice-President.— Geo. Harding, Waukesha.
Secretary and Treasurer.—John M. True, Baraboo.
Additional Members of Executive Board.—C. M. Clark, Whitewater.
J. C. Kiser, Oregon.

The following members were duly enrolled:

A. A. Arnold, Galesville.
Clinton Babbitt, Madison.
Geo. Harding, Waukesha.
J. C Kiser, Oregon.
J. B. Kiser, Oregon,
C. M. Clark, Whitewa'er.
J. M. True, Baraboo.
S. C. Fish, Reedsburg.
L. N. Fish, Reedsburg
Adelbert Stilson, Oshkosh.
H. J. Case, Baraboo.
John A. Cole, Hustisford.
William Hawthorn, Sylvan.
D. H. Hillman, Brandon.
Reuben Boyce, Brooklyn.
J. E. Owen, Brooklyn.
D. B. Holt, Danville.
S. R. Webster, Danville.
Chas. Lawrence, Danville.
P. P. Holt, Columbus.
D. J. Spaulding, Black River Falls.
John Sprecher, Madison.
Francis Brinkerhoff, Brandon.
John Steel, Alderly.
R. A. Morley, Baraboo.
G. W. Waterbury, Prairie du Sac.
Thomas Sanderson, Leeds.

Adjourned to time and place of annual meeting.

JOHN M. TRUE,
Secretary.

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FEEDING VALUES.

Professor Caldwell, of Cornell University, New York, has made public the following as the economical value of several substances below, based upon their several values as flesh-formers and fat-formers. The result obtained from corn fodder must be taken as implying the whole stalk and leaves, since the edible parts, to stock, are well known to be nearly or quite of the value of the best hay. It will be noticed that the Southern cow-pea (a species of bean that may be grown in the West) has a higher theoretical value than any of the other plants named. The table is as follows:

	Muscle-making elements.	Heat and fat elements.
Clover hay	11.4	42.1
Timothy	6.4	46.9
Timothy and red-top	7.5	46.3
Low meadow hay	7.7	45.7
Hungarian hay	6.6	44.4
Salt marsh hay	5.9	44.7
Corn fodder, field cured	4.3	37.2
Buckwheat straw	3.9	34.8
Oat straw	3.4	39.1
Rye straw	3.0	34.6
Wheat straw	3.1	33.7
Cow-pea vines	15.7	45.0
Potato	2.0	2.1
Mangolds	1.1	9.2
Sugar beets	1.0	15.5
Ruta-bagas	1.3	9.6
Carrots	1.3	9.9
Turnips	1.0	6.0
Parsnips	1.6	9.0
Cotton seed cake meal	42.5	36.9
Linseed cake meal	34.5	41.0
Linseed cake meal, new process	33.5	41.6

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AGRICULTURAL INSTITUTES.

CHAPTER 9, LAWS OF 1885.

AN ACT to provide for holding Agricultural Institutes.

The people of the state of Wisconsin, represented in senate and assembly, do enact as follows:

SECTION 1. The Board of Regents of the State University is hereby authorized to hold Institutes for the instruction of citizens of this state in the various branches of agriculture. Such institutes shall be held at such times in the months of November, December, January, February, March and April in each year, and at such places as said board may direct. The said board shall make such rules and regulations as it may deem proper for organizing and conducting such institutes, and may employ an agent or agents to perform such work in connection therewith as it may deem best. The course of instruction at such institutes shall be so arranged as to present to those in attendance the results of the most recent investigations in theoretical and practical agriculture.

SECTION 2. For the purposes mentioned in the preceding section, the said board may use such sum as it may deem proper, not exceeding the sum of five thousand dollars in any one year, from the general fund, and such amount is hereby appropriated for that purpose.

SECTION 3. This act shall be in force from and after its passage and publication.

Approved February 19, 1885. Published February 21, 1885.

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TRANSACTIONS

OF THE

WISCONSIN

State Horticultural Society,

INCLUDING

ADDRESSES AND PAPERS PRESENTED, AND PROCEEDINGS AT THE SUMMER AND WINTER MEETINGS, FOR THE YEAR 1884-5.

VOL. XV.

WILLIAM TRELEASE, SECRETARY.

MADISON, WIS.:
DEMOCRAT PRINTING CO., STATE PRINTERS.
1885.

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LETTER OF TRANSMITTAL.

To His Excellency, JEREMIAH M. RUSK,
Governor of the State of Wisconsin.

SIR: In compliance with law, I have the honor to transmit to you the fifteenth volume of the transactions of the State Horticultural Society, including a full statement of the receipts and expenditures of the Society, together with a portion of the papers read at its meetings in 1884, and such other matter as has been deemed likely to promote the horticultural interests of the state.

Very respectfully,

WM. TRELEASE,
Secretary.

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OFFICERS FOR 1885.

PRESIDENT.

J. M. SMITH, - - - - - - - - - - - GREEN BAY.

VICE-PRESIDENT.

B. F. ADAMS, - - - - - - - - - - - MADISON.

RECORDING SECRETARY.

WM. TRELEASE, - - - - - - - - - - MADISON.

CORRESPONDING SECRETARY.

B. S. HOXIE, - - - - - - - - - - - EVANSVILLE.

TREASURER.

M. ANDERSON, - - - - - - - - - - - PINE BLUFF

SUPERINTENDENT.

B. F. ADAMS, - - - - - - - - - - - MADISON.

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COMMITTEES.

EXECUTIVE COMMITTEE.

Ex-Officio.

THE ABOVE OFFICERS.

By Election.

Dist.		*Dist.*	
1.	S. HUNT, Evansville.	5.	W. REYNOLDS, Green Bay.
2.	G. C. HILL, Rosendale.	6.	Mrs. D. HUNTLEY, Appleton.
3.	B. F. ADAMS, Madison.	7.	A. G. TUTTLE, Baraboo.
4.	J. S. STICKNEY, Wauwatosa.	8.	E. G. PARTRIDGE, Warren.
		9.	WM. SPRINGER, Fremont.

COMMITTEE ON NOMENCLATURE AND NEW FRUITS.

J. C. PLUMB, Milton. GEO. P. PEFFER, Pewaukee.
A. L. HATCH, Ithaca.

COMMITTEE OF OBSERVATION.

Dist.		*Dist.*	
1.	GEO. J. KELLOGG, Janesville.	5.	H. FLOYD, Berlin.
2.	GEO. C. HILL, Rosendale.	6.	D. HUNTLEY, Appleton.
3.	B. F. ADAMS, Madison.	7.	WM. TOOLE, N. Freedom.
4.	J. S. STICKNEY, Wauwatosa.	8.	E. G. PARTRIDGE, Warren.
		9.	WM. SPRINGER, Fremont.

FINANCE COMMITTEE.

H. C. ADAMS, Madison. B. S. HOXIE, Evansville.
N. N. PALMER, Brodhead.

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MEMBERS, 1885.

Adam, John, Markesan.
Adams, B. F., Madison.
Adams, H. C., Madison.
Alcott, Wm., Brodhead.
Aldin, Isaac C., Weyauwega.
Anderson, Matt., Pine Bluff.
Anderson, Andrew, Neenah.
Arnold, A. A., Galesville.
Balch, A. V., Weyauwega.
Balsley, A. W., Weyauwega.
Barnes, A. D., Campbellsport.
Barter, Sam'l, Markesan.
Baxter, John, Weyauwega.
Baumbach, Wm. von, Wauwatosa.
Bennett, A. S., Weyauwega.
Brown, J. M., Fremont.
Callender, Robert, Fremont.
Campbell, Henry, Evansville.
Campbell, Mrs. V. H., Evansville.
Chaplin, F. H., Rutland.
Churchil, Chas., Waupaca.
Coe and Converse, Ft. Atkinson.
Cole, W. H., Brodhead.
Cotta, J. V., Lannark, Ill.
Crane, Wilder, Weyauwega.
Daniels E. W., Auroraville.
Daugherty, Wm. F., Preble.
Dibble, G. W., Evansville.
Dickerson, H. J., Appleton.
Dore, J. S., Neillsville.
Eaton, C. F., Fremont.
Emerson, M. E., Door Creek.
Fenelon, C. M., Weyauwega.
Field, S. F., East Troy.
Floyd, H., Berlin.
Freborn, S. I., Ithaca.
Gibson, H., Lind.
Gill, Wm., Dayton.
Goss, B. F., Pewaukee.
Graves, S. W., Brooklyn.
Greenman, C. H., Dodge Center, Minn
Hacker, T. L., Madison.
Haight, Nicholas, Syene.
Hamilton, C. H., Ripon.
Hanchett, Mark, Footeville.
Hatch, A. L., Ithaca.
Hill, Geo. C., Rosendale.
Hirschinger, Chas., Baraboo.
Holmes, G. W., Fremont.
Holt, M. A., Madison.
Howie, John, Waunakee.
Hoxie, B. S., Evansville.
Hubbard, R. M., Weyauwega.
Hubbard, Mrs. R. M., Weyauwega.
Hunt, Samuel, Evansville.
Huntley, D., Appleton.
Huntley, Mrs. D., Appleton.
Innis, W. T., West Rosendale.
Jeffery, Geo., 630 Chestnut St., Milwaukee.
Jewett, Z. K., Sparta.
Keeney, Miss, Weyauwega.
Kellogg, Geo. J., Janesville.
Kellogg, Emily L., Janesville.
Kindsman, C., Fremont.
King, Edmund, Whitewater.
Lawrence, F. S., Janesville.
Le Roy, J. H., De Pere.
Libby, F. D., Madison.
Loudon, F. W., Janesville.
Lowe, Victor, Palmyra.
Mahon, John, Preble.
McDonald, D., Verona.
Mack, John, Weyauwega.
Marsh, H. F., Sun Prairie.
Masters, Wm., Weyauwega.
Mathews, James, Weyauwega.
MaWhinney, Jas., Lind.
Mills, Simeon, Madison.
Morrison, W. H., Madison.
Newton, Miss M. E., De Pere.
Noehle, Theodore, Green Bay.
Olds, B. B., Clinton.
Palmer, N. N., Brodhead.
Pammel, L. H., La Crosse.
Parker, Col. —, Lind.
Partridge, E. G., Warren.
Peffer, Geo. P., Pewaukee.
Peffer, Miss Kate, Pewaukee.
Philips, A. J., Blunt, Dak.
Phœnix, F. K., Delavan.
Phœnix, Frank, Delavan.
Pilgrim, D. T., West Granville (Express office, Milwaukee).
Plumb, J. C., Milton.
Potter, C. W., Mauston.
Potter, Mrs. M. E., Weyauwega.
Radley, Mrs. A., Lind.
Reid, Wm., North Prairie.
Reid, Wm., Jr., North Prairie.
Reynolds, Werden, Green Bay.
Rich, O. A. Weyauwega.
Roe, Jas., Oshkosh.
Scheisser, Paul, Fremont.
Scribner, Joseph, Rosendale.
Seymour, A. N., Mazomanie.
Smith, Albert, Weyauwega.
Smith, Alfred, Madison.
Smith, J. M., Green Bay.
Spencer, R. C., Milwaukee.

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Spindler, Henry, Fremont
Springer, Wm., Fremont.
Springer, John, Clinton.
Steiger, Jacob, Fremont,
Stickney, J. S., Wauwatosa.
Stone, I. N., Fort Atkinson.
Suydam, J. V., Green Bay.
Tarrant, Henry, Janesville.
Thompson, H. M., St. Francis.
Toole, Wm., North Freedom.
Trelease, Wm., St. Louis, Mo.
Tuttle, A. G., Baraboo,
Vaughan, J. C., Chicago, Ill., 42 La Salle Street.
Wakefield, J., Fremont.
Warren, A. A., Green Bay.
Wilson, R. D., Platteville.
West, J. R., Evansville.
Wilcox, E., Trempealeau.
Williams, Daniel, Summit.
Wilson, William, Weyauwega.
Witt, Luther, Plymouth.
Wood, J. W., Baraboo.
Woods, William, Weyauwega.
Wrightman, E. W., Weyauwega.

HONORARY MEMBERS.

LIFE.

Dr. Joseph Hobbins, F. C. S., Corresponding Member Royal Hort. Soc., etc., ex-President, Madison.
O. S. Willey, ex-Recording Secretary.
F. W. Case, ex-Recording Secretary, Madison.
Peter M. Gideon Excelsior, Minn.

ANNUAL.

Mrs. A. A. Arnold, Galesville,
Mrs. Anna Brimmer, Richland Center.
Mrs. Isaac Clark, Galesville.
J. S. Harris, La Crescent, Minn.
C. A. Hatch, Ithaca.
Mrs. Alexander Kerr, Madison.
C. E. Morgan, Madison.
Rev. T. G. Owen, Trempealeau.
C. G. Patten, Charles City, Iowa.
Mrs. Ida E. Tilson, West Salem.

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FRUIT LIST.

APPLES.*

Seven varieties best adapted to Wisconsin—Hardiness, Productiveness and Quality taken into consideration—Duchess, Wealthy, Pewaukee, Fameuse, Plumb's Cider, Tallman Sweet, Wolf River.

Additional list for special locations—Tetofski, Red Astrachan, St. Lawrence, Fall Orange, Fall Spitzenberg, Alexander, Utter, Westfield Seek-No-Further, Willow Twig, Golden Russet, Walbridge, Orange Winter, McMahan's White.

For trial on sandy soil—Duchess, Fall Spitzenberg.

CRAB APPLES.

For general cultivation—Whitney's No. 20, Gibb, Hyslop, Sweet Russet, Transcendent.

STRAWBERRIES.

For general cultivation—Wilson, Crescent, Downing, Windsor Chief (Pistillate), with Longfellow and Mt. Vernon as late fertilizers of the Crescent.

For trial—Kentucky, Cumberland, Bidwell, Vick, Piper, Manchester (Pistillate).

Special list for light soils—Crescent, Wilson, Downer, Manchester (Pistillate).

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* NOTE.—The question of adaptation of varieties is one so largely dependent upon local conditions of soil, elevation and aspect, that a general list will not answer fully the wants of every planter, and at best can only be a general guide in the selection of varieties.

For more specific directions, the following rules and lists are furnished by the committee chosen for this purpose:

1. Locations comparatively elevated and well drained, with a cool northern aspect and fine gravelly clay soil, not very rich, may extend the general list named above to an indefinite extent, with fair prospect of success in southern and eastern districts of the state. But for warm, sheltered locations and rich soils, which induce a great growth, no section of our state can safely plant other than those varieties known to be extremely hardy.

2. The best guide in the selection of varieties is for each to plant largely of such varieties as are found successful in locations similar to that each must plant upon. For all unfavorable locations, and extreme northern districts, only the most hardy, well tried apples of the Russian or Siberian types should be chosen for general planting.

3. In the extreme northern districts, only the crown of the hills should be chosen for the orchard, with a firm soil and porous subsoil, and if these materials are wanting naturally, they should be supplied artificially.

For opinions on the varieties recommended, see transactions of the winter meeting.

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GRAPES.

For general cultivation.—Worden, Concord, Delaware, Brighton, Moore's Early.

For frosty and otherwise unfavorable locations.—Janesville, Champion.

For trial in favorable locations.—Israella, Elvira, Duchesse, Pocklington, Prentiss, Jefferson, Lady, Lady Washington.

THIMBLEBERRIES.

(Black Raspberries.)

For general cultivation.—Gregg, Miami, Doolittle.

For trial.—Ohio, Souhegan, Tyler.

RED RASPBERRIES.

For general cultivation.—Cuthbert, Turner, Brandywine.

For trial.—Shaffer's Colossal.

BLACKBERRIES.

For general cultivation.—Snyder, Stone's Hardy, Ancient Briton. (Winter protection is recommended for all).

For trial.—Taylor, Bartel's Dewberry.

PEARS.

Most likely to succeed.—Flemish Beauty.

For trial in favorable localities.—Ananas d'Été, Early Bergamot, Bartlett, Onondaga, (*Swan's Orange*), Seckel, Winter Nélis, Clapp's Favorite, Beurré d'Anjou, Doyenné d'Été.

PLUMS.

For general cultivation.—De Soto.

For special localities.—Lombard, Imperial Gage, Yellow Gage, (*Magnum Bonum*), Eldridge, Duane's Purple.

For trial.—Cheney (on recommendation of J. S. Harris).

CHERRIES.

For general cultivation.—Kentish (*Early Richmond*), Late Kentish, Morello.

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TREE AND SHRUB LIST.

EVERGREENS.

For general culture—Norway Spruce (*Abies excelsa*), White Pine (*Pinus strobus*), Arbor Vitæ (*Thuja occidentalis*), Scotch Pine (*Pinus sylvestris*), Balsam Fir (*Abies balsamea*), White Spruce (*Abies alba*).

For ornamental planting—Austrian Pine (*Pinus austriaca*), Red or Norway Pine (*Pinus resinosa*), Hemlock (*Abies canadensis*), Siberian Arbor Vitae (*Thuja orientalis*), Red Cedar (*Juniperus virginiana*), Dwarf Pine (*Pinus montana*).

For timber—White Pine (*Pinus strobus*).

For live fence posts—Norway Spruce (*Abies excelsa*).

DECIDUOUS PLANTS.

For timber—White Ash (*Fraxinus americana*), European Larch (*Larix europaea*).

Nut-bearing trees—Hickory (*Carya alba* and *C. sulcata*), Black Walnut (*Juglans nigra*), Butternut (*Juglans cinerea*).

Street shade trees—White Elm (*Ulmus americana*), Hard Maple (*Acer saccharinum*), Basswood or Linden (*Tilia americana*), Hackberry (*Celtis occidentalis*).

Trees for lawn (in order named)—Weeping Cut-leaved Birch (*Betula alba*, var.), Linden (*Tilia americana*), Hackberry (*Celtis occidentalis*), Green Ash (*Fraxinus viridis*), European Mountain Ash (*Pyrus aucuparia*), Oak-leaved Mountain Ash (*Pyrus aucaparia*, var.), European Larch (*Larix europaea*), American Mountain Ash (*Pyrus americana*), Horse Chestnut (*Aesculus hippocastanum*), Wisconsin Weeping Willow (*Salix* ————), New American Weeping Willow (*Salix* ————), Weeping Golden-barked Ash (————————), Weeping Mountain Ash (*Pyrus aucuparia*, var.) Weeping Poplar (*Populus tremula*, var.).

Shrubs for lawn (in order named)—Snowball (*Viburnum opulus*), *Hydrangea grandiflora*, Syringa (*Philadelphus coronaria*), *Deutzia*, Weigelia (*Diervilla rosea*), Upright Honeysuckles (*Lonicera tatarica* etc.), Flowering Quince (*Pyrus japonica*), Flowering Almond (*Amygdalus nanus*), Spiraeas, Strawberry Bush (*Euonymus americanus*), Fringe or Smoke Tree (*Rhus cotinus*), Purple-leaved Barberry (*Berberis vulgaris*, var.), Lilac, White and Purple (*Syringa vulgaris*), Persian Lilac (*Syringa persica*), Black Alder (*Ilex verticillata*).

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Climbers — American Ivy (*Ampelopsis quinquefolia*), Scarlet Honeysuckle (*Lonicera sempervirens*), Fragrant Honeysuckle (*Lonicera caprifolium*), *Clematis jackmanni*, Virgin's Bower (*Clematis virginiana*).

ROSES (with protection).

Climbers — Queen of the Prairie, Gem of the Prairie, Baltimore Belle.

Moss roses — Princess Adelaide, Luxembourg and others.

Hybrid and June roses — Persian, Yellow Harrison, Madame Plantier, General Jacqueminot, La France, General Washington.

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ACT OF REORGANIZATION

OF THE

STATE HORTICULTURAL SOCIETY.

CHAPTER 151, LAWS OF 1879.

SECTION 1. The executive committee of the Wisconsin State Horticultural Society shall hereafter consist of the president, secretary and treasurer of said society, and of one member from each congressional district of the state, said members from the congressional districts to be chosen annually by the county and local horticultural societies in the respective districts.

SECTION 2. The present officers and executive committee of said society shall hold their respective offices until the Tuesday next succeeding the first Monday in February, 1880, and until their successors are appointed.

SECTION 3. It shall be the duty of the said society to aid in the formation and maintenance of county and local horticultural societies, to promote the horticultural interests of the state by the holding of meetings for discussion; by the collection and dissemination of valuable information in regard to the cultivation of fruits, flowers and trees adapted to our soil and climate, and in every proper way to advance the fruit and tree growing interests of the state.

SECTION 4. The annual meeting of the society shall be held on the Tuesday next succeeding the first Monday in February of each year, for the election of its officers, the transaction of general business, and the consideration of questions pertaining to horticulture.

SECTION 5. All vacancies in the offices of said society may be filled by the executive committee; and should there be a failure to elect a member of the executive committee in any district, the vacancy may be filled by a two-thirds vote of the members of the society present at any regularly appointed meeting.

SECTION 6. It shall be the duty of the secretary of said society to make an annual report to the governor of the state of the transactions of the society, including an itemized account of all moneys expended during the year, in addition to such matters as are now specified in the law relating to the same.

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SECTION 7. The number of printed pages of said report shall not exceed three hundred and fifty, and the number of copies shall be limited to three thousand five hundred. In all other respects the publication and distribution of said report shall be in accordance with the provisions of law now in force concerning the same.

SECTION 8. The sum of $600 is hereby appropriated out of any money in the state treasury not otherwise appropriated, to aid the said society in carrying out the provisions of this act; said sum to be paid by the state treasurer upon the order of the president of said society, in such sums and at such times as shall best contribute to the prosperity of the society and the interests it represents.

SECTION 9. This act shall take effect and be in force from and after its passage and publication.

Approved March 1, 1879.

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CONSTITUTION AND BY-LAWS.

As amended February, 1885.

CONSTITUTION.

ARTICLE I. This society shall be known as the Wisconsin State Horticultural Society.

ARTICLE II. Its object shall be the advancement of the art and science of horticulture throughout the state.

ARTICLE III. Its members shall consist of *annual* members, paying an annual fee of one dollar, which shall entitle the wife of such member to the privileges of full membership, of secretaries of local horticultural societies reporting to the state society, who shall be considered members *ex-officio*; of *life* members, paying a fee of ten dollars at one time; of *honorary life* members, who shall be distinguished for merit in horticultural and kindred sciences, or who shall confer any particular benefit upon the society; and *honorary annual* members, who may, by vote, be invited to participate in the proceedings of the society.

ARTICLE IV. Its officers shall consist of a President, Vice-President, Recording Secretary, Corresponding Secretary, Treasurer, Superintendent, and an Executive Board, consisting of the foregoing officers and additional members, one from each congressional district of the state, five of whom shall constitute a quorum at any of its meetings. In addition to the foregoing officers, the presidents of all local horticultural societies reporting to this society shall be deemed honorary members and *ex-officio* vice-presidents of this society. All officers shall be elected by ballot, and shall hold their office for one year thereafter, and until their successors are elected; provided, the additional executive members may be elected by the county or local horticultural societies of their respective districts.

ARTICLE V. The society shall hold its annual meeting for the election of officers, commencing on the first Monday in February. It may also hold a meeting in December of each year, at such place and time as may be decided upon by the society, or its executive committee, for the exhibition of fruit and for discussions, and such other meetings for discussions and exhibitions, as the executive committee may direct, at such time and place as the executive board shall designate.

ARTICLE VI. This constitution, with the accompanying by-laws, may be amended at any regular meeting, by a two thirds vote of the members present.

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BY-LAWS.

I. The president shall preside at meetings, and, with the advice of the recording secretary, call all meetings of the society and have general supervision of the affairs of the society; and shall deliver an annual address upon some subject connected with horticulture.

II. The vice-president shall act in the absence or disability of the president, and perform the duties of the chief officer.

III. The secretary shall attend to all the correspondence, shall record the proceedings of the society, preserve all papers belonging to the same and superintend the publication of its reports. He shall also present a detailed report of the affairs of the society, at its annual meeting. He shall also endeavor to secure reports from the various committees, and from local societies, of the condition and progress of horticulture in the various districts of the state and report the same to the society. It shall be the duty of the secretary to make an annual report to the governor of the state, of the transactions of the society, according to the provisions of the statutes for state reports.

IV. The treasurer shall keep an account of all moneys belonging to the society, and disburse the same on the written order of the president, countersigned by the secretary, and shall make an annual report of the receipts and disbursements, and furnish the secretary with a copy of the same, on or before the first day of the annual meeting. The treasurer elect shall, before entering upon the discharge of the duties of his office, give good and sufficient bonds for the faithful performance of his duties, subject to the approval of the executive committee.

V. The executive board may, subject to the approval of the society, manage all its affairs and fill vacancies in the board of officers; three of their number, as designated by the president, shall constitute a finance committee.

VI. It shall be the duty of the finance committee to settle with the treasurer, and to examine and report upon all the bills or claims against the society which may have been presented and referred to them.

VII. The standing committees of this society shall be as follows: 1st, Committee on Finance, consisting of three members; 2d, Committee on Nomenclature and New Fruits, consisting of three members; 3d, Committee on Observation, as now provided. Said committees to be appointed annually by the executive committee of the society.

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LAWS RELATING TO THE SOCIETY.

Chapter 151, *Laws of* 1879.

SECTION 6. It shall be the duty of the secretary of said society to make an annual report to the governor of the state of the transactions of the society, including an itemized account of the moneys expended during the year, in addition to such matters as are now specified in the law relating to the same.

SECTION 7. The number of printed pages of said report shall not exceed three hundred and fifty, and the number of copies shall be limited to three thousand five hundred. In all other respects, the publication and distribution of said report shall be in accordance with the provisions of the law now in force concerning the same.—[*Revised Statutes*, 1878.]

Chapter 320, *Laws of* 1883.

SECTION 7. There shall be printed annually by the state printer, and on the order of the commissioners of public printing, the following documents. * * * * * * * * * *

2. Twelve thousand copies of the transactions of the Wisconsin State Horticultural Society, together with such abstracts of reports of county and other horticultural societies, and such other matters pertaining to fruit growing and other horticultural interests of the state as shall be deemed important; provided, the number of pages shall not exceed two hundred. * * * * * * * * * * * * *

SECTION 8. Eleven thousand five hundred volumes of said report shall be bound in cloth, uniform in style with volumes previously published, each volume to contain one copy of each of the reports designated in the preceding section, and shall be distributed as follows: Thirty copies to each member of the legislature; one hundred copies to the State Historical Society; twenty-five copies to each county agricultural society and district industrial association which embraces two or more counties and furnishes the State Agricultural Society a report of its proceedings; one hundred copies to the State Horticultural Society; twenty-five copies to each county horticultural society that shall report its organization, with officers elect, and give an abstract of its proceedings for publication in said volume to the secretary of the State Horticultural Society; one hundred copies to the State Dairymen's Association; fifty copies to the State University; five copies to the Wisconsin Humane Society; two copies to each public library in the state; and the remaining copies to the State Agricultural Society for distribution by its secretary.

SECTION 9. Five hundred copies of the transactions of the State Agri-

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cultural Society, and five hundred copies of the transactions of the State Horticultural Society, shall be bound singly, in cloth; five hundred copies of the transactions of the State Dairymen's Association, and five hundred copies of the report of the department of agriculture of the State University, shall be bound in paper, for the use of these several societies and departments for distribution or exchange.

CHAPTER 435, LAWS OF 1885.

SECTION 7. 2. Sixteen thousand five hundred copies of the transactions of the Wisconsin State Horticultural Society, together with such abstracts of reports of county and other horticultural societies, and such other matters pertaining to fruit growing and other horticultural interests of the state as shall be deemed important; *provided*, the number of pages shall not exceed three hundred. * * * * * * * * * *

SECTION 8. Thirteen thousand volumes of said report shall be bound in cloth, uniform in style with volumes previously published, each volume to contain such part of one copy of each of the reports designated in the preceding section, as the compiler shall select, the size of said joint report not to exceed one thousand pages; and shall be distributed as follows: Thirty copies to each member of the legislature; one hundred copies to the State Historical Society; twenty-five copies to each county agricultural society and district industrial association which embraces two or more counties, and furnishes the State Agricultural Society a report of its proceedings; one hundred copies to the State Horticultural Society; thirty copies to each county horticultural society; two hundred copies to the State Dairymen's Association; one hundred copies to the experiment station of the state university, twenty-five copies to the library of the state university; five copies to the Wisconsin Humane Society. To the governor, lieutenant-governor, secretary of state, state treasurer, attorney general, state superintendent of public instruction, railroad and insurance commissioners twenty-five copies each; to each public library in the state two copies; and the remaining copies to the State Agricultural Society for distribution by its secretary.

SECTION 9. Twenty-five hundred copies of the transactions of the State Horticultural Society shall be bound singly in cloth and one thousand in paper. Twenty-five hundred copies of the State Dairymen's Association shall be bound in cloth and twenty-five hundred in paper. Twenty-five hundred copies of the report of the Agricultural Experiment Station of the state university shall be bound in cloth and twenty-five hundred in paper for the use of these several societies and departments for distribution or exchange.

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CHAPTER 36, LAWS OF 1885.

To appropriate to the Wisconsin State Horticultural Society a sum of money.

SECTION 1. There is hereby appropriated to the Wisconsin State Horticultural Society the sum of two thousand dollars, out of any money in the state treasury not otherwise appropriated. This appropriation is made to cover the years of 1885 and 1886, and shall be paid to said society in two annual equal payments, viz.: in 1885 and 1886.

SECTION 2. This act shall take effect and be in force from and after its passage and publication.

Published April 10, 1885.

LAW RELATING TO TREE BELTS.

Revised Statutes, 1878.

SECTION 1469. Every owner or possessor of five acres of land, or more, who shall successfully grow by planting with forest trees, consisting of the following kinds, or such species thereof as will grow to the height of fifty feet or more, viz.: arbor vitæ, ash, balsam fir, basswood, beech, birch, butternut, cedar, black cherry, chestnut, coffee tree, cucumber tree, elm, hackberry, hemlock, hickory, larch, locust, maple, oak, pine, spruce, tulip tree and walnut, tree belts in the manner and form prescribed in the next section, shall be entitled to have the land on which such tree belts grow exempted from taxation from the time the trees commence to grow until they shall reach the height of twelve feet, and after they have attained that height, to receive an annual bounty of two dollars per acre for each acre so grown.

SECTION 1470. Such tree belts shall be planted on the west or south sides of each tract of land, be of uniform width through their entire length, contain not less than eight trees, at nearly equi-distance, on each square rod of land, and be at least thirty feet wide for each five acre tract, sixty feet wide for each ten acre tract, and one hundred feet wide for each square forty acre tract, and upon all square tracts of land, upon two sides thereof. All tree belts owned by the same land owner must be planted not to exceed a fourth of a mile apart, and on the west and south sides of every square forty acres, and shall not exceed one-fifth of the entire tract of land on which the same are planted; provided, that when the east and north sides, or either, of any tract of land, is bounded by a public highway, a tree belt one rod wide may be planted next to said highway, although it, with the

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others on the west and south sides, shall exceed one-fifth of the whole tract; and tree belts may be planted on any other lines within each forty square acres, by permission of the assessor.

SECTION 1471. The assessor shall, upon the application of the owner thereof, in each year, at the time of assessing the personal property in his district, make a personal examination of all tree belts for which bounty or exemption from taxation is claimed, and ascertain whether they have been planted as required in the preceding section, and are thriftily growing, and if he shall be satisfied thereof, he shall not assess the same for taxation unless the trees therein shall have attained the height of twelve feet, and in that case he shall deliver to the owner a certificate that he is entitled to an annual bounty of two dollars for each acre of such tree belts, stating therein the whole amount of such bounty and giving a description of the entire land of which the tree belts form a part, and the amount of such bounty shall be credited by the treasurer in payment of any taxes assessed on such land, as so much cash; but if not so satisfied, the assessor shall assess the land for taxes or refuse to grant any certificate for the bounty, as the case may require; and if, after any certificate for such bounty shall have been issued, the owner of any such tree belts shall suffer the same to die out by want of cultivation or otherwise, or shall cut the same down, or in any other way allow the same to be so thinned out, that in the opinion of the assessor he ought no longer to receive such bounty, he shall give the treasurer written notice thereof, and thereafter no further bounty shall be allowed until such owner shall again receive a certificate therefor.

TO REGULATE THE SALE OF CRANBERRIES.

Chapter 384, *Laws of* 1885.

SECTION 1. The legal and standard cranberry barrel in this state shall be twenty-three and three quarters inches high, sixteen and one fourth inches in diameter at the head, and eighteen inches in diameter at the bilge, inside measure. Every manufacturer of barrels for cranberries shall stamp or brand his name with the letters, W. S. on such barrels to indicate that they are the Wisconsin Standard in size. All sales of cranberries in packages less than a barrel shall be by the bushel or quart, struck or level dry measure. A standard bushel crate for cranberries shall be twenty-two inches long, twelve and one fourth inches wide by seven and one half inches deep inside measure.

SECTION 2. Any person who shall in such manner stamp or brand cranberry barrels of a less capacity than is provided in the first section of

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this act, shall be guilty of a misdemeanor and upon conviction shall be fined in a sum not less than five nor more than twenty-five dollars and costs of suit, and may be committed to jail until such fine and costs are paid. Any person selling cranberries in barrels not thus branded, of less capacity than herein provided shall be liable to the purchaser in damages to three times the amount of such shortage, and all contracts or agreements far the sale of cranberries by the barrel or crate, unless otherwise specially stipulated shall be understood and construed to mean legal standard barrels or crates.

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TRANSACTIONS

AT THE

SUMMER MEETING

HELD BY THE

Wisconsin State Horticultural Society,

At La Crosse, June 24–5, 1884.

The summer meeting of this society was held, according to announcement, at La Crosse, with the Northwestern Society, June 24th and 25th. The sessions and exhibition were in the court house, which, in the shady park in which it is located, proved a quiet and pleasant place for the purpose.

President J. S. Harris, of the Northwestern Society, introduced Judge B. F. Bryant, who welcomed the State Society to the beautiful city and its hospitalities. President J. M. Smith of the State Society who was then called to preside at the sessions, declined to make any set speech, but said that he hoped to be able to assist with suggestions growing out of his experience, as the work of the day advanced.

J. S. Harris, of La Crescent, Minn., read a paper on Progressive Horticulture, prefaced by some personal remarks of peculiar interest. This paper contained many excellent thoughts and suggestions.

Mrs. Vie H. Campbell presented a paper concerning women's work and how to make it easier. She stated as her proposition that a woman could not, like a man, have one trade or profession, but must have a dozen or so — cooking, washing, tailoring, etc. The paper in some degree was

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a plea for domestic co-operation. She cited as illustrative, the Co-operative Home at Evansville, in this state, where twenty families have their meals at a central house, paying $2.50 per week for adults; quarter, half and three quarter rates for children, and a shilling a meal for visitors. This paper was one of great practical interest.

Mrs. Ida E. Tilson read a bright, entertaining paper entitled "Nature's Suggestions," which was received with applause.

Mrs. Ida Clark, of Galesville, read a paper on "Flowers in the Home." The paper was a plea for the home, and for bringing into use every means within reach to make home the happiest place in the world for the children. Especially was the influence of the parents dwelt upon, and the tremendous responsibility resulting therefrom impressed upon the audience.

Mrs. H. M. Lewis gave a history of the Flower Mission, in such an interesting way that the project was broached of starting a branch of the mission in La Crosse.

A paper by Rev. T. G. Owens, of Trempealeau, on "Man's Relation to the Physical World," was then read, and followed by a practical statement of the work of the State Society, its sources of strength and weakness, and suggestions for the good of the society, by J. C. Plumb, of Milton.

Hon. A. A. Arnold, of Trempealeau, read a well prepared paper on youthful training, claiming that a business education was what the child wanted.

Each of these papers was followed by a free discussion, in which much practical common sense was shown.

The committee on resolutions introduced the following, which were adopted:

Resolved, That the thanks of the Wisconsin State Horticultural Society, and of the Northwestern Horticultural Society are hereby tendered to the officials of La Crosse county for their generosity in allowing the use of the Court House, and for the many other courtesies extended upon this occasion.

Resolved, That we tender our sincere thanks to the people of La Crosse and the members of the Northwestern Horticultural Society for their bountiful entertainment, their excursion around this beautiful city and on the river, and our kind reception at their homes.

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Resolved, That we recognize the courtesy of the Chicago & Northwestern, and the Chicago, Milwaukee & St. Paul Railway companies in giving the usual reduction of fare to those passing over their roads to this meeting.

Resolved, That we invite more discussion at our convention, with a free use of the question box.

Resolved, That the writers of papers be requested not to exceed fifteen minutes in their presentation, and that speakers taking part in the discussions be restricted to five minutes unless granted special permission to speak longer.

Resolved, That the president of the Wisconsin Horticultural Society as such use his influence with the Commissioner in behalf of our society, for an appropriation of not less than one thousand dollars, for the use of said society at the New Orleans exhibit, and that said funds be used for the purpose of making said exhibit for the best interests of the state.

PREMIUMS AWARDED.

STRAWBERRIES.

Greatest and best collection, first, Geo. J. Kellogg; second, E. Wilcox; third, J. M. Smith.

Best new seedling, never before exhibited, first, N. Hintgen; second, J. C. Kramer.

Best quart of strawberries, first, Mrs. T. B. Benton.

Best quart Wilson, first, J. S. Harris; second, E. Wilcox.

Chas. Downing, first, N. Hintgen; second, J. S. Harris.

Manchester, first, E. Wilcox; second, G. J. Kellogg.

Bidwell, first, E. Wilcox.

James Vick, first, G. J. Kellogg.

Crescent Seedling, first, J. S. Harris; second, A. G. Tuttle.

Big Bob, first, G. J. Kellogg.

Capt. Jack, first, J. C. Kramer.

Sharpless, first, N. Hintgen.

PLANTS AND FLOWERS.

Greatest and best collection of green house and hot house plants by professional, first, J. A. Salzer; second, Paul Bork; third, H. Kienahs.

Greatest and best collection of green — and hot house plants by amateur, first, Mrs. J. W. Weston; second, J. C. Kramer.

Geraniums in bloom, first, J. A. Salzer; second, H. Kienahs.

Roses in bloom, first, J. A. Salzer.

Fuchsias in bloom, first, J. A. Salzer; second, H. Kienahs.

Floral design, first, H. Kienahs; second, H. Kienahs.

Bouquet of roses, first, J. A. Salzer; second, Mrs. E. Wilcox.

Pansies, first, William Toole; second, J. A. Salzer.

Wild flowers named, first, Isabelle Van Loon; second, Henry Willsie.

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The premium for best hand bouquet being unappropriated the committee recommended that it be paid to Mina Kramer, whose bouquet of wild flowers, though unnamed, deserved special mention for tasteful arrangement and large variety.

VEGETABLES.

Best collection, first, H. Gulliam; second, N. Hintgen; third, J. M. Smith.
Asparagus, first, J. C. Kramer; second, N. Hintgen.
Beets. carrots and peas, first, N. Hintgen; second, H. Gulliam.
Pieplant, first, N. Hintgen, second, J. S. Harris.
Onions, first, H. Gulliam, second, N. Hintgen.
Turnips, first, J. M. Smith; second, H. Gulliam.
Cabbage, first, N. Hintgen; second, J. M. Smith.
Cauliflower, first, H. Gulliam.

The exhibition of summer fruits, flowers, plants and vegetables was one of the best our state has ever had; J. A. Salzer, N. Hintgen and H. Gulliam, of La Crosse, J. S. Harris, of La Crescent, and J. M. Smith, of Green Bay, all showing vegetables which were remarkable for luxuriant growth and perfection. Eight-inch cabbage heads, beets and onions nearly full grown, fine heads of cauliflower, cucumbers, carrots, peas, lettuce and potatoes, made a showing that augurs well for a year of plenty in central Wisconsin.

The display of plants and flowers was to many the most attractive, and is worthy of special mention. Paul Bost, John A. Salzer and H. Kienah made each a large display of green-house plants, which vied with the vegetables in luxuriance. William Toole showed his beautiful pansies. Bouquets were entered by Mrs. Peffer, Mrs. Wilcox and Mrs. Campbell, while others, not entered for premiums, were on exhibition. Especially noteworthy were collections of wild flowers by Mina Kramer and Henry Willsie.

The strawberry show was not large, but of good quality considering the distance which most of the fruit came, and the extremely hot and rainy weather. The fruit of J. M. Smith, of Green Bay, was badly injured by detention on the way, and so with the stool of Loudon's No. 1, which had fifty perfect berries on it at the time of starting. Yet Mr. Smith showed an immense stool growth of Wilson, proving that with him it had not run out, but that in his

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soil and under his high pressure treatment it was second to none in vigor or productiveness.

The meeting at La Crosse was marked by the same courtesies and hospitality that are uniformly experienced by the society in its conventions with local societies, and promises to prove of more than usual value in encouraging the believers in progressive horticulture in Wisconsin.

MEETING AT THE STATE FAIR.

MADISON, WIS., Sept. 17, 1884.

In response to a call issued by the president, the members of the Society present at the fair assembled in the office of the Board of Supervision, at the capitol, at 7:45 P. M.

The meeting was called to order at the appointed time, and, in the absence of the president and the vice-president, Hon. Matt. Anderson was called to the chair. On motion, Mr. Trelease was elected secretary *pro tem.*

On motion of Mr. Kellogg, Hon. B. F. Adams and the acting secretary were appointed a committee to prepare suitable resolutions relative to the bereavement of the Society in the case of its late efficient secretary, for presentation at the annual meeting.

Professor Trelease was formally elected *ad int.* secretary of the Society, to fill the vavancy caused by the death of Mrs. Lewis, on motion of Mr. Kellogg, and consented to serve in that capacity until the annual meeting.

A motion introduced by Mr. Kellogg, authorizing the payment to Mr. Lewis, of the salary which would have become due our late secretary had she lived until the end of the year, was carried.

The part to be taken by the society in the New Orleans Exposition was brought up for informal discussion, and President Smith, who came in at about this time, read a communication from Hon. Parker Earle on the classes in which the Society might compete for premiums. In response to inquiries, members from different sections of the

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state expressed their opinion as to the amount of fruit likely to be available for exhibition during the winter.

The following report of the judges on fruit now on exhibition at the state fair, was presented by Mr. Pilgrim, on behalf of the executive committee of the State Agricultural Society, with the request that the judges be instructed by the Horticultural Society:

"We find that the premium list for the state fair calls for separate collections for sweepstakes. Part of your exhibitors have brought such collections and found table room; others have collections which cannot be displayed for want of tables and plates; still others have entered for sweepstakes without presenting separate collections, under the impression that this was allowable under the old rules of the society. What shall we do?

GEO. J. KELLOGG,
Chairman Committee, Class 33."

On motion, the subject was placed before the society for discussion, after which the call for separate sweepstake collections was decided unnecessary for the present fair.

A motion of Mr. Kellogg, authorizing the judges in this department to request the Agricultural Society to strike out the clause requiring such collections for future exhibits, was carried.

Mr. Kellogg introduced a motion, which was carried, requesting the Agricultural Society to define "best," as applied to fruit exhibited at the state fairs, in accordance with the exhibition rules of the Horticultural Society.

President Smith stated that about $100 could be spared for premiums at the annual meeting of the Horticultural Society, if it were thought best to call out a fruit display at that time.

On motion, the society decided to hold a fruit exhibition in connection with the February convention; and the president and secretary were authorized to prepare a premium list for that meeting.

The society adjourned *sine die*, at 9 P. M.

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TRANSACTIONS AT THE ANNUAL MEETING AT MADISON, FEBRUARY 2–6, 1885.

CAPITOL, February 2, 1885.

The society was called to order by the president at 7:45 P. M.

On motion, the following committee on programme was announced — Geo. J. Kellogg, A. L. Hatch, H. Floyd.

The following delegates were in attendance on the convention:

Peter M. Gideon and J. S. Harris, Minnesota State Society.

J. S. Harris, Northwestern Horticultural Society.

J. Wakefield, Waupaca Co. Horticultural Society.

On call of the president, the secretary read the following report, which was accepted and ordered printed.

SECRETARY'S REPORT.

The sad death of our late secretary, Mrs. Lewis, makes it again my duty to briefly report on the condition of the society, its work and its needs.

Unfortunately, I was so closely confined by my University duties during the early part of the year that I am unable to report in detail upon the work of the society during this time; but I may say that when I resumed active work in the fall I found indications of careful thought and conscientious work on the part of one who, had she lived, would have done much for the future of this organization. Much of the work planned by Mrs. Lewis necessarily stopped at her death, through the inability of one not familiar with it to continue it at once.

Owing to the press of legislative printing, it is doubtful whether we can hope to distribute the next volume of our TRANSACTIONS much, if any, before our next annual meeting, as the spring will be well advanced before the printer can attend to it, although the copy could be placed in his hands within a few weeks if it could be used.

For several years we have noticed an increased demand

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for our reports by societies of similar aims to our own. So far as it has been possible, such requests have been met promptly, and the exchanges thus inaugurated have proved beneficial to this society.

Frequently letters come from former residents of Wisconsin, who have removed to the newer west, and who naturally turn to their native state for aid and encouragement in their efforts to surround their new homes with orchards; much as many of you turned to the experienced fruit growers of the east for similar help a quarter of a century or more since. The conditions under which many of them work are so similar to those prevalent in Wisconsin that we confidently believe that they can profit by your experience much more than you could by that of eastern orchardists; and the numerous extensive failures, reported in our volumes, carry a lesson of caution which can be read between the lines of every page when not explicitly stated. That this is appreciated is testified by cordial letters from the newer states.

The increasing demand for our volumes suggests a subject presented at our last annual meeting, which should not be forgotten now. I refer to the urgent necessity for some change in our publication law. While this provides for the printing of a larger number of copies than have ever before been issued, it places but five hundred in our hands for distribution, and your hearty support should be given to the committee to which the matter was referred last winter. It is to be remembered that the Dairymen's Association and the Experiment Station of the University are also in need of a larger number of separately-bound volumes of their reports than they now receive, and by combined action with their representatives your committee should be able to convince the legislature of the wisdom of continuing the generous edition now printed, while allowing a much greater number of separate copies for the use of each of the organizations contributing matter to the joint report, as has been recommended by our liberal-minded Governor in his last message.

In pursuance of its past policy the society has steadily worked for the advancement of the horticultural interests

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of the state, and we are gratified by reports showing that it has met with no small degree of success, though much remains to be done. Existing local societies are in need of more active personal help than is now given them; and new societies should be formed in every section of the state. Each member of the State Society should give thought to this matter, beginning his work in his home neighborhood; and your secretary and other officers should hold themselves ready to respond to any and all appeals for their presence whenever it can be productive of good.

Under the present law each county society reporting to us is entitled to twenty-five copies of the joint report containing the transactions of this society. This number is too small for the use of several societies which now send in their reports, and a larger number could profitably be placed in the hands of all, for their members know where and how to use the volumes to best advantage in the sections in which they live.

Town societies, which can also be made of much local interest and profit, are unable to obtain our reports, no provision being made for them under the present law. Both of these facts should be urged upon the attention of the committee on publications appointed by this society.

A young, or, more properly, undeveloped interest, which promises in the near future to be of great importance to the state, is to be brought before this convention by Mr. Morgan's paper on cranberry culture. A demand for help in the pioneer work they are doing is made by the men now engaged in developing this industry. To help them by bringing within their reach the results of others who have gone over the same ground elsewhere, and to preserve the records of their successes and failures for future use, are objects which come within the legitimate field of this society, and should be identified with its other work.

Now that the capitol extension is completed, we may hope for permanent quarters in it, and one of the first things that should demand the attention of your secretary is the arrangement and improvement of the library, and the

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proper display of a set of models of the fruits adapted to Wisconsin.

Closely connected with this is the question of fruit displays at the meetings of the society, and at state and county fairs. Whatever other interest such displays may have, it may safely be said that their primary object is, and should be, the education of the public in the appearance and characters of fruits adapted to our climate. To this end, greater care should be taken to provide every plate exhibited with a legible card bearing its name, which our able committee on nomenclature will see is correct. Several practical questions concerning the advisability of duplicating varieties in grouped collections of showy or adapted fruit, and the more exact definition of terms in the premium lists of this and the State Agricultural Society are to be brought up by members of the society and are deserving of careful consideration. The decisions reached should be plainly stated in our rules of exhibition.

The several plans touched upon as worthy of thought demand not only enthusiastic work, but money, and every member of the society should do whatever may be in his power to sustain the committee appointed last winter to solicit more financial aid from the state. With the present aid accorded us, little can be accomplished, and progress must of necessity be very slow. But with greater possibilities of work, I am hopeful that the society will accomplish much, not only for the commercial prosperity of a large class of our citizens, but for the increase of the home comforts of a much larger class, who think that a farmer's time is too precious to be spent in getting anything from the soil but more soil with which to acquire more soil, while the comforts that might be added to their lives by a very little exertion are never thought of as within their reach or worthy of the least effort.

Respectfully submitted,

WILLIAM TRELEASE,
Secretary.

February 2, 1885.

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On motion of Mr. Kellogg, the president of the society was requested to confer with the legislative committee on claims with respect to the bill for an appropriation for this society for the next two years.

The treasurer's report, showing a balance on hand of $131.82, was read, and referred to the finance committee.

At the request of the chair, the memoir of the late Mrs. Lewis, which appears elsewhere, was read by Hon. B. F. Adams, on behalf of the committee appointed in September.

On motion of Mr. Kellogg this report of the committee was adopted by a rising vote.

On motion of Mr. Kellogg a copy of the report of the committee was ordered transmitted to the family of the deceased lady, whose death is felt as a personal bereavement by nearly every member of the society.

The following resolution, introduced by Mr. Hatch, was unanimously carried:

Resolved, That as a slight token of the esteem in which the memory of the late Mrs. H. M. Lewis is held by this society, the secretary is hereby instructed to cause copies of this volume to be handsomely bound, with a suitable presentation page in each, and to present one of the same to each member of the family of Mr. Lewis.

On recommendation of the secretary, Article V, of the constitution of the society was amended so as to read as it now stands, the amendments being verbal changes, designed to harmonize this article with section 4 of the act of reorganization of the society.

The society adjourned at 9 o'clock, to 9 A. M., of Tuesday.

CAPITOL, February 3, 1885.

The society was called to order at 9:15 A. M., president Smith in the chair.

The committee having reported no programme for the convention, the society proceeded to transact such business as was presented.

The premium list for the State Fair was received by the Horticultural Society for revision, and on motion of Mr. Kel-

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logg, was referred to the following committee, appointed by the chair: Geo. J. Kellogg, A. L. Hatch and B. F. Adams.

The following resolution, introduced by Mr. Hatch, was adopted:

Resolved, That each exhibit shall be so placarded or labeled as to show the name and postoffice address of the grower.

On motion of Mr. Hatch, Article III. of the constitution was amended by making the secretaries of local horticultural societies members, *ex-officio*, of the state society.

The society then proceeded to a revision of the fruit list.

APPLES.

A motion to strike the Pewaukee from the list of seven adapted varieties, was lost by a single vote, the sentiment of a majority of the members present being, that while the trees of this variety are hardy and bear well on the original soil, it is not adapted to many localities.

The Wolf River was discussed at some length, the opinion of Mr. Jeffery being that it was inferior to the Fall Orange. This variety, however, contributed largely to the success of the society at the New Orleans Exposition.

Mr. Hatch spoke of McMahon's White, stating that it should appear in the list of varieties for trial under general conditions, as he considered it perfectly hardy, and no better adapted to sandy soil than to others. The same statements were advanced by Mr. Hatch and Mr. Tuttle with respect to the Orange Winter, and on motion both were placed in the second list.

On a motion to strike out Walbridge it appeared that on basswood soil in certain localities the variety is hardy, although not generally doing well throughout the state. Mr. Adams remarked that in the vicinity of Madison, though a fair bearer, it has of late shown a tendency to scab (*Fusicladium*), which yearly becomes more troublesome. The motion was lost by but two votes.

Price's Sweet was removed from the list, on motion, as it is believed to be the worst variety formerly named there.

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STRAWBERRIES.

The Bidwell was believed by Mr. Hatch, Mr. Adams, President Smith and others to have had nearly sufficient trial to require removal from the trial list, as being thus far a poor fruiter and especially susceptible to frost and other unfavorable conditions; but as some of the speakers thought that it might ultimately prove of value, a motion to strike it from the list was lost by a nearly unanimous vote.

On motion of Mr. Kellogg, the Manchester was added to the trial list, being also retained on the special list. Mr. Smith and others spoke very favorably of the variety, Mr. Kellogg rejoicing in President Smith's alleged discovery that there was a possible better variety than the Wilson, which, however, was not fully admitted by Mr. Smith.

Mr. Harris and several other members objected strongly to the Sharpless as a nearly worthless variety, calculated to mislead planters if allowed to remain on the recommended list. The general testimony was that it is great in promise but always disappointing, and on motion it was canceled by a unanimous vote.

GRAPES.

A motion of Mr. Hatch to add the Champion to the general list was lost, the quality of the fruit being considered inferior to that of the Janesville, while it is little earlier, and has been fruited by but few members of the society. Mr. Gideon thought that few men would eat either this or the Janesville when Worden and Brighton can be had at about the same time; but it was claimed by Mr. Hatch that both of the former varieties are adapted to the early market and may be relied on for profit.

Mr. Tuttle reported the Janesville as especially liable to rot, of late years; but Mr. Jeffery, Mr. Hatch and others thought that the general endurance of the variety, rendering its successful growth possible by the inexperienced, adapts it particularly to general culture by others than professional vineyardists, and thus gives it a decided worth.

On motion of Mr. Harris, the Janesville and Champion

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were placed in a special list for frosty and unfavorable localities.

RASPBERRIES.

Mr. Gideon stated that the Gregg does well in Minnesota, on a northern exposure, where the Miami is of little value.

Mr. Kellogg favored the removal of Tyler and Souhegan to the recommended list, but the experience of the society was judged insufficient to warrant the recommendation as yet.

The Philadelphia was claimed by Mr. Kellogg to be valuable in small gardens because of its slight habit of spreading, but Mr. Adams and others regarded it as a very poor variety for Wisconsin, with little hardiness.

On motion, it was stricken from the list by a unanimous vote.

BLACKBERRIES.

Mr. Kellogg reported the Ancient Briton blackberry as doing remarkably well about Ripon, where it is largely grown, while it does better with winter protection.

Mr. Adams and Mr. Tuttle stated that it does well as far north as Madison and Baraboo without protection. Stone's Hardy and Snyder have proved less resistant to cold winters than the Ancient Briton with Mr. Tuttle, while the latter was generally conceded to be a better fruit in appearance. According to Mr. Kellogg, neither of these three varieties will stand a temperature of more than —25° without receiving serious injury, unless protected.

Mr. Hatch spoke of a new variety of the wild blackberry under cultivation by himself and Mr. Adams, which gives promise of good and plentiful fruit, while it is perfectly hardy. It is proposed to place it in the hands of other horticulturists in a few years, for more extended trial.

Mr. Adams reported favorably on the Dewberry, recommended for trial. The fruit is very large and sells well, and, the trailing vines being covered by snow, they appear to be hardy; but it was thought well to cover them lightly to prevent possible injury. The berry ripens very early and is considered a superior fruit by purchasers.

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Mr. Jeffery stated that the Flemish Beauty pear cracks so badly nearly every season as to deserve nothing further than recommendation for trial, but the society allowed it to stand because of its success in favorable localities.

PEARS.

The Kieffer was discussed at some length, but the sentiment of the members present was that it is not sufficiently hardy to promise success in the state, while Mr. Smith confirmed the general opinion as to its worthlessness for all purposes but preserving; describing its flavor as intermediate between that of an artichoke and a raw potato.

PLUMS.

Mr. Harris reported favorable on another year's experience with the Cheney plum, which yields large fruit of good value for the early market, about La Crosse. The variety originated in the western part of the state, from a stray seedling of common parentage, but showing characters of the *Prunus americana* type.

TREES.

On motion a list of trees for road side planting was adopted and added to the recommended lists.

On motion a list of nut-bearing trees was also added.

By vote the secretary was instructed to insert the botanical names of the plants recommended for culture in the lists of the society.

Adjourned to 1:30 P. M., at 12:15.

CAPITOL, February 3, 1885.

The society was called to order at 2 P. M., President Smith in the chair, and proceeded to the election of officers, after making Mr. J. S. Harris an honorary annual member.

On an informal ballot for president, J. M. Smith received 10 votes and J. S. Stickney, 3. This vote was then made formal and unanimous in favor of Mr. Smith.

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The ballot for vice-president not giving a majority to any one candidate, the second ballot resulted in the election of B. F. Adams.

The present secretary was re-elected.

On motion, the secretary was instructed to cast the vote of the society for B. S. Hoxie and Matt. Anderson to fill respectively the offices of corresponding secretary and treasurer for the following year.

On motion, the secretary was directed to cast a ballot for B. F. Adams as superintendent for the coming year.

The following members of the executive committee were then elected:

District.	District.
1. S. Hunt, Evansville.	5. W. Reynolds, Green Bay.
2. Geo. C. Hill, Rosendale.	6. Mrs. D. Huntley, Appleton.
3. B. F. Adams, Madison.	7. A. G. Tuttle, Baraboo.
4. J. S. Stickney, Wauwatosa.	8. E. G. Partridge, Warren.

9. Wm. A. Springer, Fremont.

The following committee on Nomenclature and New Fruits was elected:

J. C. Plumb, Geo. P. Peffer, A. L. Hatch,

The committee of Observation was then elected, as follows:

District.	District.
1. G. J. Kellogg, Janesville.	5. H. Floyd, Berlin.
2. G. C. Hill, Rosendale.	6. D. Huntley, Appleton.
3. B. F. Adams, Madison.	7. Wm. Toole, North Freedom.
4. J. S. Stickney, Wauwatosa.	8. E. G. Partridge, Warren.

9. W. A. Springer, Freemont.

The present Finance committee was re-elected.

The president's report was then called for, and Mr. Smith presented the following:

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PRESIDENT'S ADDRESS.

Members and Friends of the Wisconsin State Horticultural Society:

My time has been so completely occupied for a number of months past that in place of an opening address at our annual convention, I must content myself with asking you to accept a short report of our work at the World's Exposition now in progress at New Orleans. At the last annual meeting of the society, it was resolved to make an attempt to get up an exhibition of the fruits of the state at the World's Exposition then in contemplation. You passed a resolution instructing me to appoint the necessary committee to carry on the work. After my appointment as the alternate commissioner, with Mr. E. D. Holton as the commissioner, we had a conference and resolved to appropriate a sum not to exceed $1,000, for the purpose of a fruit exhibition at New Orleans. I promised Mr. Holton that it should be a good one, and he turned the entire control of it into my hands. After some deliberation in my own mind, I asked Mr. J. C. Plumb, and Mr. George P. Peffer to accept the positions as the committee to gather the fruits, trees, plants, shrubs, etc., for the exposition. They accepted the positions, and divided the work between themselves, Mr. Plumb taking the fruit department, and Mr. Peffer the balance of the work. The understanding was that all necessary cash outlays should be paid but no pay allowed for the time spent in the work.

Arrangements for cold storage of our fruit were made in Milwaukee, and its collection was commenced in September and continued until in November. After it was nearly or quite all in, I visited the cold storage rooms, and found a large amount of fruit there. I supposed, as a matter of course, that it all belonged to our state society collection.

After the arrival of the fruit in New Orleans, I ascertained that instead of all the fruit belonging to the state society collection, as I had supposed, a large share of it was Mr. Peffer's private collection, another large share belonged to

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Mr. Wm. Springer, still another share was claimed by Mr. Plumb's son, thus leaving the share belonging to the society but a small proportion of the whole, and utterly inadequate either for filling the entries that I had made, or for making a creditable show.

This was all the more annoying from the fact that I had been very earnest in my desire to have a very large and fine collection, and had been repeatedly assured that the fruit should be there, and that it should be very fine. Mr. Holton had also received the same assurances.

As some considerable time seemed to be necessary in the collection of the fruit, I allowed the rule of not allowing any pay for time to be broken, and Mr. Plumb drew from time to time for his services previous to leaving the state, $54.00. I allowed these bills with others that were legitimate, because of my anxiety to have a fine display of Wisconsin apples at New Orleans.

After ascertaining just what our situation was, and that a fine showing by our society without the aid of the collections of Mr. Peffer and Mr. Springer was impossible, I proposed to them to waive their private entries and let me have their fruit for the benefit of the society. I was very anxious to make the entries for the best varieties adapted to the extreme north, and told them that in case we took any of those premiums I would allow them to have the money and our society would take the medals.

They both acceded to my request at once, and by their aid our society has made a splendid showing, and we have come out with high honors. The following will show our position as compared with our competitors.

Our district embraced all of the country east of the Rocky Mountains and north of 40°. This of course covers nearly all of the great apple growing districts east of the Rocky Mountains. There were fourteen states present with their apples for competition. There were seventy-nine premiums awarded. Of this number, Maine took four, Vermont one, New Hampshire none, Massachusetts none, Connecticut three, Pennsylvania one, Ohio two, Illinois eleven, Michigan

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nine, Iowa thirteen, Nebraska seven, Minnesota two, Canada two, Wisconsin twenty-four.

Seventeen medals were awarded, of which we have six.

Mr. Peffer and Mr. Springer worked most earnestly and faithfully in setting up and preparing the fruit for the exhibition. The same may be said of Mr. J. P. Roe of Oshkosh. I trust that some suitable acknowledgment of their generosity and faithful aid will be placed upon the records of our society.

"I send inclosed a list of our premiums on trees and shrubs at New Orleans. They were collected here, and set out and arranged there by Mr. George P. Peffer of Pewaukee. I have not the premium list at hand although it is safe to say that no state or society has equalled us in the list of premiums. I am in receipt of a letter, giving a number of additional horticultural premiums taken by the Wisconsin Society as follows: For premiums on trees and shrubs—best collection of crabs, $20; best collection of plums, $25; best collection of fruit trees adapted to the northwest, silver medal and $100; best collection of all kinds of fruits, etc., silver medal and $100; best collection of evergreens north of 35°, silver medal and $100; best collection of fir, medal and $25; best collection of juniper, silver medal and $25; best collection of Thuja, silver medal and $25; best single pine tree, $10; handsomest arbor vitae, $10; best collection of viburnum, $10; best collection of shrubs adapted to the northwest, $50; one hundred varieties of North American trees against the world, gold medal and $200. Mr. Geo. P. Peffer, of Pewaukee, who was left in charge of the horticultural exhibit, has written me conveying this information.

Yours truly,

J. M. SMITH."

Mr. Peffer performed the work of selecting, putting up and shipping the trees and shrubs to my entire satisfaction. The premiums upon them have not yet been awarded; but we stand a fair chance of getting our share of them. [The following letter which was afterward sent to the *Western Farmer*, should be quoted in this connection:—ED.]

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The premiums already awarded us amount to $400, and I shall be rather disappointed if the amount is not increased to at least $500. We also have a pleasant showing of apples in our collective exhibit in the government building.

Such in brief is the result thus far of our work at the largest Horticultural exhibition ever seen upon this continent if not in the world.

Notwithstanding my disappointment at first, the outcome of the exposition has been satisfactory. "All's well that ends well."

With fourteen competitors we have had awarded to us nearly one third the entire number of premiums, a trifle over one third of the medals, and about one third of the money awarded in our department. Of all the new varieties of apples upon exhibition, none excited so much attention as the Wolf River, though other varieties were noticed more or less. Taking the exhibition altogether there is no doubt but that Wisconsin stands very much higher to-day, and I firmly believe, justly so as a fruit growing state, than she ever did before. And after hearing the reports of failures and losses in other states I am better satisfied than ever before that we have not only a good state to live in, but a good state in which to grow all the fruits adapted to northern climates.

On motion of Mr. Kellogg, the president's report was laid upon the table until evening, and the society adjourned at 3 o'clock to attend a meeting of the executive committee of the State Agricultural Society, called to listen to arguments on the question of excluding intoxicating beverages and games of chance from the next state fair, after passing a resolution requesting their exclusion.

CAPITOL, February 3, 1885.

The society reconvened at 7 P. M., President Smith in the chair.

Mr. Kellogg called up the president's report for consideration and adoption.

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Mr. Plumb and others spoke briefly on the subject of the report, after which Mr. Hatch introduced the following resolution, which was unanimously carried:

Resolved, That the thanks of the Wisconsin State Horticultural Society are hereby tendered to Commissioner E. D. Holton, President J. M. Smith, and to Mr. Geo. Peffer, Mr. Wm. Springer, and Mr. J. P. Roe for efficient help and untiring zeal in making the Horticultural Exhibit for Wisconsin at the World's Fair at New Orleans a success.

Resolved, That as a token of our esteem the secretary be instructed to have a sufficient number of volumes of this year's transactions bound in gilt binding with an appropriate page bearing this resolution, and to present a copy to each of the above-named gentlemen.

The treasurer's report, which follows, was reported correct by the finance committee, and on motion, it was adopted and ordered published.

TREASURER'S REPORT.

RECEIPTS.

Feb. 4, 1884.	Balance in treasury	$6 22	.....	
Feb. 6, 1884.	Received of state treasurer	500 00	.....	
Feb. 6, 1884.	Membership dues, from the secretary.	43 00	... .	
April 4, 1884.	Membership dues, from the secretary.	10 00	.....	
Aug. 15, 1884.	Membership dues, from the secretary.	3 00	.....	
Sept. 18, 1884.	Membership dues, from Wm. Reid...	1 00	.....	
				$563 22

DISBURSEMENTS.

Feb. 7, 1884.	J. G. Kellogg, delegate to Illinois convention	$3 09	.....	
Feb. 7, 1884.	J. M. Smith, expenses at Green Bay...	22 00	.....	
Feb. 7, 1884.	Wm. Trelease, salary, expenses of Mrs. Tilson and postage	32 50	.....	
Feb. 7, 1884.	F. H. King, railroad fare, Ripon meeting	14 45	.....	
Feb. 7, 1884.	J. M. Smith, incidental expenses	25 00	.....	
Feb. 7, 1884.	Expenses of delegates from Minnesota	7 00	.....	
Feb. 7, 1884.	Geo. J. Kellogg, overpaid dues.....	1 00	.....	
Feb. 7, 1884.	Mrs. H. M. Lewis, postage.....	5 00	.....	
Feb. 7, 1884.	Geo. P. Peffer, delegate to Des Moines	25 95	.....	
Feb. 18, 1884.	A. J. Philips, delegate to Minneapolis..	8 60	.....	
March 11, 1884.	J. C. Plumb, expenses at Baraboo meeting	$5 00	.....	
March 13, 1884.	Mrs. H. M. Lewis, incidental expenses.	20 00	.....	
May 15, 1884.	Mrs. H. M. Lewis, salary.....	25 00	.....	
June 25, 1884.	Mrs. H. M. Lewis, expressage	85	.....	
June 25, 1883.	Premiums paid at La Crosse.....	50 00	.....	
June 25, 1884.	J. M. Smith, expenses at La Crosse....	12 38	.....	
June 25, 1884.	B. S. Hoxie, expenses at La Crosse....	11 00	.....	
June 25, 1884.	Mrs. V. H. Campbell, expenses at La Crosse	22 84	.....	

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June	25, 1884.	J. C. Plumb, expenses at La Crosse....	8 18	.....
June	25, 1884.	A. G. Tuttle, expenses at La Crosse...	2 80	.....
June	25, 1884.	Geo. J. Kellogg, expenses at La Crosse.	8 35	.....
June	25, 1884.	Mrs. H. M. Lewis, expenses at La Crosse	7 11	.....
June	25, 1884.	Mrs. H. M. Lewis, expenses of society, postage, etc.....	15 00	.....
June	25, 1884.	C. Hirschinger, expenses at La Crosse.	4 50	.....
June	25, 1884.	Mrs. Isaac Clark, expenses at La Crosse	1 30	.....
June	25, 1884.	Geo. P. Peffer, expenses at La Crosse..	7 50	.....
Aug.	7, 1884.	Mrs. H. M. Lewis, salary.....	25 00	.....
Sept.	25, 1884.	H. M. Lewis, salary due Mrs. Lewis ...	50 00	.....
Nov.	18, 1884.	Schmitz Bros. & Co., label holders	10 00	.....
				$431 40
Jan.	3, 1885.	Balance in treasury	.....	131 82

The committee on finance to whom was referred the above report, have examined the same, with the accompanying vouchers, and report the account correct.

H. C. ADAMS,
N. N. PALMER,
B. S. HOXIE.

After listening to a paper on fungoid plant diseases, read by A. L. Hatch, of Ithaca, the society adjourned at 8 o'clock to the following evening, to listen to the address of President Arnold, of the Agricultural Society.

CAPITOL, February 4, 1885.

The society was called to order at 7:15 P. M., the President in the chair.

The President presented a communication from the Waupaca County Horticultural Society, inviting the State Society to meet with that society in June next at Weyauwega. On motion, the invitation was cordially accepted, by a unanimous vote.

The report of the committee on a premium list for the state fair was called for, and presented by Mr. Kellogg. On motion, the report was ordered transmitted to the Agricultural Society, by whom it was originally referred.

The usual appropriations of $25.00 for incidental expenses of the President, and $100.00 for the salary of the Secretary, were voted.

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On motion the Secretary's salary was voted increased to $200.00 annually, provided the appropriation of $1,000.00 should be made by the legislature to the society, as recommended by the Governor.

On motion of Mr. Hoxie, the Secretary was authorized to employ a reporter for the conventions of the society, provided increased appropriations were received.

On motion, Hon. H. C. Adams was continued as a committee of one to further confer with the Governor with respect to the assignment of rooms in the Capitol, which the committee had so far been unable to secure.

The following resolutions were adopted by a vote of the society:

Resolved, That we favor the binding of the transactions of our society in separate volumes; and that not less than three thousand five hundred volumes, of 850 pages each, be printed, to be disposed of according to the law of 1879.

Resolved, That we favor the former appropriation of $150.00 annually for the illustrating of said volume.

On the motion of Mr. Adams a premium of $1.00 awarded Mr. M. E. Emerson in 1883, but not then claimed, was ordered paid.

On motion of Mr. Kellogg, the expenses of displaying fruit at the annual convention were ordered paid.

The society then listened to an instructive paper by J. S. Stickney, of Wauwatosa, which was followed by a discussion reported elsewhere.

On motion, the following report of the committee on awards was read and adopted, a vote of thanks being tendered the judges.

REPORT OF THE COMMITTEE ON AWARDS.

To the Honorable President and Members of the Wisconsin State Horticultural Society:

We, the committee selected by you to make awards upon the articles on exhibition at this convention, have given them a careful examination and discharged the duty imposed upon us according to our best judgment and know-

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ledge of the adaptability of the varieties to cultivation in this state, and reported upon the same.

In addition, we beg leave to make mention of the splendid show upon the tables, from which the prize selections have been taken, of four hundred and fifteen plates in seventy-three varieties of apples, nearly all in good merchantable condition and of fine appearance; four plates of pears and twenty-two of grapes, one sample of amber cane syrup, and samples of boiled cider, cider, apple sauce and pure apple jelly, altogether making a collection so tastefully arranged as to reflect honor upon the tact, industry and perseverance of the exhibitors, and credit to the state possessing such ample resources and a people having the skill and intelligence to develop the same.

The exhibition must prove a fruitful source of good to the whole people of this great state, and will encourage the members of the State Horticultural Society to renewed efforts in the prosecution of horticulture that shall crown their labors with lasting renown.

The only lacking feature in the exhibition was a display of flowers.

PETER M. GIDEON,
JOHN S. HARRIS,
WM. TOOLE.

PREMIUMS AWARDED AT THE ANNUAL MEETING AT MADISON, FEBRUARY 2-6, 1885.

Best ten varieties of winter apples adapted to Wisconsin, H. Floyd, Berlin	$6 00
Second best, C. Hirschinger, Baraboo	4 00
Third best, G. J. Kellogg, Janesville	2 00
Best five varieties of winter apples adapted to Wisconsin, C. Hirschinger, Baraboo	3 00
Second best, H. F. Marsh, Sun Prairie	2 00
Third best, H. Floyd, Berlin	1 00
Best five varieties of fall apples, with written statement of manner of keeping, H. Floyd, Berlin	3 00
Second best, C. Hirschinger, Baraboo	1 00
Third best, G. Jeffery, Milwaukee	50
Best display of showy apples, not to exceed ten varieties, C. Hirschinger, Baraboo	3 00
Second best, H. Floyd, Berlin	2 00
Third best, G. Jeffery, Milwaukee	1 00

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Best plate Alexander, C. Hirschinger, Baraboo	$1 00
Second best, G. Jeffery, Milwaukee	50
Best plate Ben Davis, H. F. Marsh, Sun Prairie	1 00
Second best, Wm. Reid, North Prairie	50
Best plate Fameuse, H. Floyd, Berlin	1 00
Second best, C. Hirschinger, Baraboo	50
Best plate Golden Russett, C. Hirschinger, Baraboo	1 00
Second best, A. L. Hatch, Ithaca	50
Best plate Haas, C. Hirschinger, Baraboo	1 00
Second best, G. J. Kellogg, Janesville	50
Best plate Northern Spy, H. F. Marsh, Sun Prairie	1 00
Best plate Orange Winter, A. L. Hatch, Ithaca	1 00
Best plate Pewaukee, C. Hirschinger, Baraboo	1 00
Second best, H. Floyd, Berlin	50
Best plate Plumb's Cider, H. Flood, Berlin	1 00
Second best, C. Hirschinger, Baraboo	50
Best plate Tallman Sweet, C. Hirschinger, Baraboo	1 00
Second best, H. Floyd, Berlin	50
Best plate Utter, H. Floyd, Berlin	1 00
Second best, C. Hirschinger, Baraboo	50
Best plate Walbridge, C. Hirschinger, Baraboo	1 00
Second best, H. Floyd, Berlin	50
Best plate Wealthy, M. E. Emerson, Door Creek	1 00
Second best, H. Floyd, Berlin	50
Best plate Westfield Seek-No-Further, C. Hirschinger, Baraboo	1 00
Second best, H. F. Marsh, Sun Prairie	50
Best plate Willow Twig, H. Floyd, Berlin	1 00
Second best, B. S. Hoxie, Evansville	50
Best plate Wolf River, Wm. Spinger, Fremont	1 00
Largest and best display of Crab Apples, C. Hirschinger, Baraboo.	2 00
Largest and best display of Pears, Geo. Jeffery, Milwaukee	2 00
Largest and best display of open-air Grapes, with written statement of method of keeping, Wm. Ried, North Prairie	3 00
Second best, A. L. Hatch, Ithaca	2 00
Largest and best display of Fruit, all kinds, C. Hirschinger	4 00
Second best, Geo. Jeffery, Milwaukee	3 00
Third best, H. Floyd, Berlin	2 00

Mr. Hatch — I should like to hear from Messrs. Harris and Gideon, of Minnesota.

Mr. Harris — Mr. President and gentlemen of the Wisconsin State Horticultural Society. We bring to you the hearty greetings of the members of the Minnesota Horticultural Society, and their best wishes for your success in this meeting, and the growth and prosperity of your Society in the future. We come to you, not to make pretty speeches, but to learn from you some of the whys and wherefores of your success in fruit culture, and to get an insight into your methods and management, that we may be able to carry to our friends words of encouragement. There is no other kindred society in which we feel so deep and lively an interest as in yours. We look upon you as more than our neigh-

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bor, as our sister just a little older according to date of birth, but each about equal in rich, ripe experiences and failures in fruit culture. In the past our disasters may have been greater than yours, and that would have a tendency to age us sooner, but we do, and ever shall, cherish a deep veneration and warm friendship for the old veterans of your society, who have given the best years of their lives to experiments for the development of the possibilities of horticulture in the northwest, and every success that has followed their noble work has made us glad. We have never felt the pangs of jealousy, but we are a little vain and often think that our Minnesota is destined to get ahead of your Wisconsin; but when troubles and disasters overtake us, as they have very frequently in the past, there is and has been no other friend we feel so like looking to for sympathy and council as our elder sister, Wisconsin.

More than one half of your state possesses a climate and soil very similar to ours, and so far is about as unfavorable for the successful production of the favorite varieties of the fruits of the Middle and Eastern states as our own. We know that your skilled and practical men are engaged in originating new varieties and experimenting with the old for the purpose of finding something adapted and that may be profitably grown in that region, and we cherish a hope that when you have found it it will also be congenial to our soil and climate. Several times in the past it has been our happy privilege to welcome prominent members of your society to sit with us in our annual councils and join in our deliberating and they have done us good. Several times my friend Gideon, myself and others of our members have enjoyed the privilege of attending your annual meetings and we have always been exceedingly well received and most hospitably entertained and it has resulted in no harm to us, and we do hope that the most friendly relations may continue to exist between the two societies. But I warn you that we shall try very hard to be the biggest sister in the near future, and I do not know but we are now, for I really think that our Wealthy apple is a little better than your Wolf River; any way the name is suggestive.

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However, we are not going to stop with the Wealthy. We are starting several experimental stations and hope soon to enlist every farmer, farmer's wife and sons and daughters in the state into the rank and file as experimenters, and then if we do not succeed we may come over the line for recruits.

Our late annual meeting, held at St. Paul two weeks since, was an interesting and profitable one — more so than we had expected under the circumstances. It was feared that the great World's Exposition in progress at New Orleans would overshadow everything else, and on the strength of that the meeting was not extensively advertised, and our secretary, probably to help us out, called the meeting jointly with the State Amber Cane Association, without a programme or any order of business, or provision for a single address, paper or report. Four days before the opening of the meeting we arranged a hasty programme and appealed directly to the individual members to turn out and bring along something to help make the meeting interesting. As a result, we had a spirited meeting, and a fair attendance of members, and we also had a fine exhibition of fruits, vegetables and seeds. We believe that we are making some progress in horticulture, and that we have gained the confidence of our people. We expect to see more and more of a horticultural taste cultivated among our farmers, and to see them improving their homes and home surroundings, and to see good fruit so plenty and cheap as to be within the reach of all classes for every-day consumption. Our friend Tuttle was present during the entire meeting, and we felt that we were very much benefited by his presence, but we greatly missed the genial Peffer.

Finally, we are glad that your state has won such laurels in the horticultural department at the World's Exposition. There is but one other state in all the Union that we had rather had taken the prizes, and I own that we are a little disappointed; but never mind, some day she shall beat you, and I hope you will be as proud of it as we are of your success at this time. We believe that the honors have been richly earned and the awards honorably and fairly given.

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I would also congratulate you upon the exhibit made in connection with this meeting—it is the most complete and best show of apples that has ever been made at this season of the year in the northwest, and will reflect credit upon you as a horticultural society. No wonder that you beat the world at New Orleans. And now I will extend to you one and all an invitation to come and see us in the home of the Wealthy apple. Our next annual meeting will be held at Minneapolis, commencing on the third Tuesday of January, 1886.

A motion authorizing the secretary to pay $25.00 to the Mississippi Valley Horticultural Society for fifty copies of Volume 2 of their Transactions, for use by this society, was here introduced and carried.

The following resolutions, introduced by Mr. Plumb, were unanimously adopted by the society, and the secretary was instructed to secure a fitting memoir of the deceased:

WHEREAS, In the order of nature and Providence, Charles Downing, of Newburg, New York, has been called from the labors of this world to the higher life, it is hereby

Resolved, I.—That in the deceased we have lost from our ranks one who justly stood first in our country and second to none in the world, in pomological literature. And one to whose untiring research we are indebted for the present perfection of that great work, "Fruit and Fruit Trees of America," commenced by his brother, the lamented A. J. Downing, many years ago.

II.—That the character of the deceased as known by his life and labors, is worthy of our emulation, and is especially commendable to students of horticulture and pomology everywhere.

III.—That we, members of the Wisconsin State Horticultural Society, hereby extend our sympathies to the friends of the deceased, and express our hope that in due time the many unpublished but invaluable records of Mr. Downing's life work may be added to that already now before the public.

IV.—That a copy of these resolutions be sent to the friends of the deceased, and also be published with a memorial paper in the next volume of our report.

The following resolutions, introduced by Mr. Kellogg, were unanimously adopted.

Resolved, That the thanks of the Wisconsin Horticultural Society are tendered to His Excellency, Governor Rusk, and to the Superintendent of

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Public Property, for rooms appropriated and courtesies enjoyed at this convention.

Resolved, That the thanks of the Wisconsin State Horticultural Society are tendered to the railroads for reduced rates.

Resolved, That the president be authorized to send such delegates to kindred societies, during the coming year, as in his judgment he thinks best.

Mr. Tuttle reported his attendance on the meeting of the Minnesota State Society.

On motion of Mr. Kellogg, the expenses of members attending the coming summer meeting were ordered paid, in case the finances of the society should allow.

The following resolution, introduced by Mr. Kellogg, was adopted:

Resolved, That we hold our annual meeting as horticulturists on Monday, Tuesday and Wednesday, and any joint convention thereafter, and that a programme be prepared and published.

The society adjourned to 9 A. M., on Friday, at 10 P. M.

CAPITOL, February 6, 1885.

The society met at 9:30 A. M., President Smith in the chair.

The subject of blackberry culture being called up for discussion, it was said that about Ripon the Ancient Briton was made very profitable by employing light winter protection. Mr. Stone, of Fort Atkinson, said that, in that section of the state, Stone's Hardy and Snyder were the main reliance. Protection in winter was not resorted to generally, but the speaker was becoming convinced of the desirability of light protection even for those varieties considered hardy without it. The plants are merely bent down after loosening the soil a little with a spading fork on the side to which the stool of plants is to be bent and the latter is gently pushed over. Then a few forksfull of dirt are thrown over the branches to hold the plant in place, the main reliance for protection being placed on the snow that falls in sufficient quantity to cover the plants that have been bent. Plants protected in this manner mature their fruit three to six days earlier than others beside them left unprotected. Eight acres of 1-year old bushes were laid by two

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men in three days' work. Full-grown bushes require double the labor.

With protection one hundred bushels of fruit per acre was considered a good average crop by Mr. Stone. More might be obtained; less was unprofitable.

On the question of varieties, the speaker said that the Ancient Briton was a larger, more attractive berry than either of the others named, but it was no more productive nor of better quality than either of them in his experience. Customers who had been accustomed to Stone's Hardy and Synder, preferred them to the Ancient Briton for table use, notwithstanding the superior size and appearance of the latter.

Mr. Harris stated that in Minnesota some berry growers protect their plants in the manner described by Mr. Stone. Occasionally a cane is broken, especially in the case of the Snyder, which has more brittle wood than other varieties. The Ancient Briton proves satisfactory in Minnesota, provided the fruit is left on the vine until fully ripe.

Hon. B. F. Adams said that where the mercury seldom goes below —30° F., winter protection is scarcely necessary for the Snyder or Stone's Hardy blackberries. On clay soil there is so large a breakage that he does not resort to it. In the severe winters preceding, a few buds have been winter-killed, and the yield has been lessened. After a mild winter the crop is often very large, about Madison; after severe winters, one hundred to one hundred and twenty-five bushels per acre is an average yield. The plants prove more susceptible to a moderate degree of cold with a high wind than to a lower temperature without high wind. The speaker felt hopeful that new varieties perfectly adapted to the climate of Wisconsin and of first quality as to fruit could be obtained in the course of a few years, from our wild vines by cultivation and selection.

President Smith suggested that the hardiness of wild plants — blackberry, raspberry and strawberry — might be in part due to the protected situations that they naturally affect; but Mr. Adams said that new plants of seedlings now being tested on his place were placed under the most un-

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favorable conditions to kill out all but the strongest, which prove very hardy.

Mr. Floyd plows the ground on both sides of the rows of his plants, which he bends in the furrows for protection. Two days' labor suffices to lay an acre of plants. The furrows made are four to five inches deep. The plants are set in rows eight to nine feet apart in his neighborhood. The bushes are pinched off at the height of three feet; three to five canes being left to a hill and induced to vigorous branching by the pinching off of the canes. Mr. Floyd's berries are grown on light soil, easily worked.

Mr. Stickney said that every fruit-grower should be cautioned against setting blackberries on rich soil, or on clay soil. Too rich soil stimulates growth so late in the season that winter killing is inevitable. The poorest, lightest soil on the place is adapted to the most successful growth of the fruit. The strong point of Stone's Hardy was stated to be its early maturing of wood on soils adapted to blackberry culture.

According to Mr. Stone, the only failures of Stone's Hardy reported to him were due to efforts to stimulate the plants on rich soil.

In Mr. Adams's experience manuring was profitable even for blackberries.

Mr. Stone said further, that while he believed poor soil better adapted to the growth of the fruit than rich soil, he would not discourage anybody from moderate manuring, providing the plants were given winter protection, which was then more necessary. Bearing might be stimulated by this treatment.

Mr. Adams rigidly pinches back the main canes and branches until the first or middle of August, when the wood left will be pretty certain to ripen. The canes so treated ripen perfectly, even on rich land. Raspberries are given the same treatment.

In reply to a question, Mr. Frank Phoenix, of Delavan, said that the Marlboro raspberry had been fruited by him on one plant. In thirty days from planting this gave one hundred berries, but the hardiness of the variety was still to be tested.

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The fruit, while large and well formed, was not otherwise superior to other varieties. In color it lies between the Shaffer and Crimson Beauty.

President Smith remarked on the diversity of opinion on the flavor and quality of the fruit of this variety, which Mr. Phoenix thought might possibly result from the age of the plant bearing it.

Mr. Hazeltine asked how the currant slug could safely be kept under, as customers object to fruit on which hellebore has been used.

Mr. Smith and others said that white hellebore is safe and sure in its action.

Mr. Adams spoke of dusting with flour of sulphur as a successful means of keeping these sawfly larvæ down.

Mr. Stone used a hot solution of alum, which is sprinkled on by a watering pot.

Mr. Trelease said that land plaster, ashes or even road dust, sprinkled on the plants in season was found almost as satisfactory as hellebore, but the latter was perfectly safe if applied so as not to be inhaled, as it was removed by rains before the fruit was ripe.

Mr. Harris spoke briefly of a native plum, the "Rolling Stone," introduced by Mr. O. M. Lord, of Minnesota City, which he said was very promising, the fruit keeping nine days after picking, while the skin is loose, peeling as easily as that of a tomato for table use or canning. The canned fruit has something of the flavor of prunes. The original tree, which has been in bearing for upward of twenty years, is still in good condition and bears well; cultivated trees bear equally well and produce fruit but a little smaller than the De Soto, which this variety nearly equals in productiveness. The quality of the fruit referred to made this a very promising variety.

In reply to a question by Mr. Harris, Mr. Trelease referred to a paper in volume 2, of the proceedings of the Mississippi Valley Horticultural Society, as giving a resume of what is known of the grape-rot in the United States.

On motion, the secretary was authorized to pay the ex-

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penses of entertaining the Minnesota delegates to the convention.

The usual resolution was passed, making ladies who had contributed papers to the joint convention, on invitation of the Horticultural Society, honorary annual members.]

The Society adjourned *sine die* at 11 A. M.

REPORTS OF LOCAL SOCIETIES.

FREMONT HORTICULTURAL SOCIETY.

SATURDAY, January 5, 1884.

The society met at the house of the president, in Fremont, for the election of officers, and the discussion of questions connected with horticulture. The meeting was called to order by President Eaton.

The following officers were chosen for the ensuing year: President, C. F. Eaton; vice-president, Henry Spindler; secretary, J. Wakefield; treasurer, Jacob Steiger.

Executive Committee — J. M. Brown, T. P. Looker, W. A. Springer.

C. F. Eaton, delegate to the convention of the state society, recently held at Green Bay, and W. A. Springer, delegate from the county society, were called on for reports of that meeting, and stated that Waupaca county took the first premium on fruit, and still didn't try very hard. It had on exhibition about 200 plates of apples, over 150 of which were from Fremont. The exhibitors were E. W. Wrightman, A. S. Bennett, C. M. Fenelon, W. Masters, Mr. Wilson, of Weyauwega, Hollis Gibson, Mr. MaWhinney, of Lind, W. A. Springer, M. Riley, J. Billington, J. M. Hickman, of Fremont.

They had one of the best times they ever enjoyed, a pleasant trip, first-class entertainment, and fully believe that the Green Bay people are among the most hospitable to be found on the western continent.

After partaking of an excellent repast, furnished by our

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host and hostess, the society adjourned, the next meeting to be called by the committee sometime during strawberry season.

J. WAKEFIELD.
Secretary.

GRAND CHUTE HORTICULTURAL SOCIETY.

This society has been in successful operation since 1871. At that time and for several years after, the meetings were held annually and semi-annually. In 1879 the constitution was revised and a resolution passed that four meetings should be held each year. Since then, the society has met regularly in April, July, October, and January, every year. The topics discussed have been those pertaining to the seasons. The past year the meetings have been more pleasant than at any former time; the attendance large, the membership increasing, and the exhibition of plants, flowers and fruit has been uniformly good. The year just closed has been one of great abundance in every department of horticulture, and the bountiful crops now in store are a constant incentive to greater effort the coming spring. The members manifest an increasing interest in fruit and flower culture. One, who is engaged in market gardening, has added a fine greenhouse to his grounds the past season. Many will set some of the new and choice fruits and flowers in the spring. Volumes of Transactions are distributed each year and are much perused by the society. The annual meeting was held January 17th. The election of officers resulted in the choice of L. L. Randall, president; Mrs. D. Huntley, secretary; A. H. Burch, treasurer. This meeting was appointed at 10 o'clock A. M. The morning was spent in conversation. After dinner the time was devoted to reading and a discussion of the newer varieties of grapes and apples. Many members were present with their entire families, and all returned home with high hopes that the coming season will witness greater effort and larger success in horticulture than we have ever known.

MRS. D. HUNTLEY, *Secretary.*

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GREEN LAKE COUNTY HORTICULTURAL SOCIETY.

The adjourned annual meeting of the Markesan Horticultural Society was held February 16, 1885. The weather being bad, and sickness in some of the families, there was not as large an attendance as there otherwise would have been. The display of fruits and flowers, considering the time of the year, was very good.

The officers of last year were all re-elected, as follows:

President — Miss Fannie L. Mather.
Vice-President — Mr. Chas. Lambert.
Treasurer — Mrs. C. S. Whittier.
Secretary — Miss E. J. Whittier.

After due consideration the name of the society was changed from the Markesan Horticultural Society to Green Lake County Horticultural Society.

The meetings we have held have proved to be instructive as well as entertaining, bringing forth thought, study and new ideas that would have remained dormant had it not been for the suggesting influence of the meetings.

The transactions of the State Horticultural Society for 1883 and 1884 were received, distributed and highly appreciated.

E. J. WHITTIER, *Secretary*.

REPORT OF JANESVILLE HORTICULTURAL SOCIETY.

The report of this society is but little change from former ones. No new members have been added during the year, but the old ones keep their shoulders to the wheel and we still keep on.

Several meetings have been held with pleasure to all present.

The annual meeting was held December 4, 1884 and officers elected for the ensuing year, as follows:

President — Geo. J. Kellogg.
Vice-president — B. Spencer.
Secretary — E. B. Heimstreet.

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Treasurer — J. B. Whitney.

Trustees — J. J. R. Pease, D. E. Fifield, Jas. Helms, A. S Wickham, O. P. Robinson.

Geo. J. Kellogg elected delegate to State Society, 1885.

Geo. J. Kellogg and wife elected delegates to Mississippi Valley Association at New Orleans.

Treasurer reported all bills paid and a balance of one hundred dollars ($100) in the treasury.

Respectfully,

E. B. HEIMSTREET,

Secretary.

January 8, 1885.

NORTHWESTERN HORTICULTURAL SOCIETY.

The annual meeting of the Northwestern Horticultural Society was held in the court house, in La Crosse, December 9, 1884. The attendance of members was small and the attendance of spectators was moderate also, but a good deal of genuine interest was manifested by those present. President Harris made a report of his labors as a delegate to the state society, last February, which was satisfactory.

The rules of the American Pomological Society were read and referred to the executive committee of the society for adoption or revision, report to be made by publication in the daily papers. Very little other business was accomplished during the morning.

The afternoon session opened with a paper from Mr. E. Wilcox, on "Apple Growing of the Past and Present," that was well received.

Mr. Kramer, of La Crescent, reported the discovery of a new raspberry seedling.

The election of officers for the ensuing year then occurred, with the following result:

President — John A. Harris, La Crescent.

Vice-President — E. Wilcox, La Crosse.

Second-Vice President — John F. Hosmer, Shelby.

Third Vice-President — Mrs. Ida M. Tilson, Hamilton.

Secretary — John Van Loon, Holland.

Treasurer — Mrs. W. P. Powers, La Crosse.

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The officers are menbers *ex-officio* of the executive committee. Three other members were elected as follows: John A. Salzer and R. Calvert, La Crosse; E. Markle, Shelby.

Messrs. Hosmer, Van Loon, George Gable and Mrs. Wilcox reported on the fruit exhibit, which was not large but contained some fine specimens. Mr. Wilcox exhibited seventeen varieties of apples, George Gable thirteen. John C. Kramer showed six seedlings, and a plate of Tallman Sweet. John Turnbull, a winter seedling, sweet, and a specimen called the "Plum Cider." Mrs. Hosmer and Mrs. Markle exhibited some fine canned fruits.

Mr. Salzer presented a paper on house plants.

Mr. Markle discussed strawberries somewhat, saying he had a good crop last season and that plants were in good condition at the beginning of winter. He then branched off into the apple question, and complained that La Crosse had not a market place and a canning establishment to furnish a market for the apple crop.

This provoked discussion, and the members generally seemed inclined to lay the fault of not having a better market here entirely to La Crosse; when Mr. Calvert suggested that there was an opportunity for the members to show their faith by taking stock in a canning establishment themselves, before demanding that others should invest.

Mr. Salzer, Mr. Calvert and Mr. Hosmer stated they were ready to take stock.

Mr. Van Loon spoke very discouragingly of apple raising for profit, though he admitted that his Duchess apples had paid him.

Those best posted said they sold Duchess apples early, when they were green, and that they were readily and profitably marketed then.

Mr. Harris said he made more out of his apples than can be made out of ordinary farm products. He thought this country should supply the west and that eventually there would be a good market there. The manufacture of cider and vinegar was suggested as a means of using apples.

Plums were discussed at some length and those who had

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best luck seemed to be those who kept poultry and allowed them to run among the trees. Cultivation and fertilizing were considered necessary by some. The Cheney plum, a wild variety found in Vernon county some years ago, now raised by Mr. Markle and Mr. Hosmer, was shown. It is as large as a medium peach and a very fine fruit.

The president appointed the following committee on observation who are to present papers at the next annual meeting:

Strawberries — J. M. Gray, Trempealeau, and E. Markle, Shelby.

Apples — E. Wilcox, La Crosse, A. J. Philips, Hamilton, Geo. Gable and J. F. Hosmer, Shelby.

General small fruits — J. F. Hosmer.

Grapes — John C. Kramer, La Crescent.

Market gardening — John Van Loon, Holland.

Flowers — Mrs. Dr. Laflin, La Crosse, Mrs. Ida M. Tilson, Hamilton.

Canning fruits — Mrs. J. M. Barclay, La Crosse.

Insects — Dr. J. Renggley.

On motion of Mr. Wilcox, Mr. John S. Harris was elected an honorary member for life. Mr. Harris acknowledged the compliment in a few words.

The next meeting of the society is to be held on the first Tuesday in March, and Messrs. Harris, Markle and Van Loon, and Mesdames Tilson and Laflin have been requested to prepare papers upon subjects in which they are interested.

JOHN VAN LOON,
Secretary.

WAUPACA COUNTY HORTICULTURAL SOCIETY.

During the past year the meetings of our society have been pretty well attended. Our winter meeting was held in Weyauwega, January 25, 1884, at which our officers were chosen.

W. A. Springer, delegrate to the Green Bay meeting in December, gave a verbal report of that meeting. He read

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a list of premiums received by Waupaca county, fully maintaining our reputation as a first class fruit-raising county.

The following is a list of officers the present term:

President — Alvin S. Bennett, Royalton.

Vice-president — G. W. Taggart, Weyauwega.

Secretary — J. Wakefield, Fremont.

Treasurer — J. A. Mathews, Weyauwega.

Ex. committee — W. A. Springer, chairman; W. Willrow, C. F. Eaton.

Delegate to state society — W. A. Springer.

Our fall meeting was held at the house of I. C. Alden, and well attended by the members and families, resulting in our usual picnic.

We had a fine display of apples, mostly our county seedlings, and we were not ashamed of them. Of course, some of them must disappoint us, it cannot be otherwise. But take them all together we challenge the whole Badger state to find another county that can produce more, finer looking, better flavored, and hardier seedling apples than ours.

At our fall meeting the subject of tree blight was discussed, with the usual result, no one being any wiser for it.

Our exhibition of grapes was poor; in fact, it amounted to nothing; but it was not our fault. Many grapes the past season failed of having a single perfect berry, but the vines appear all right for another year.

We have about fifty members, the majority being *working* members. We were very much disappointed in the small number of reports that were doled out to us by the state. If our state is forced to be "economical" until economy borders on parsimony, let some other expenditures be criticised a little, and do not go so sharp for the poor crab apple raisers!

J. WAKEFIELD,
Secretary.

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REPORTS OF COMMITTEE OF OBSERVATION.

FIRST DISTRICT — GEO. J. KELLOGG, JANESVILLE.

As I find no report from our district for 1883, I will briefly go over the ground; and to better understand the association of the changing winters, I will give a synopsis of the weather.

The winter of 1880–1 gave 52 days when the thermometer was at zero and below, aggregating..... 606°
1881–82, only 11 days below, aggregating..... 61°
1882–83, 47 days below, aggregating..... 597°
1883–84, 33 days below, aggregating..... 371°
1884–85, (to Feb'y 12) 37 days below, aggregating..... 459°

Thus it will be seen that of the past five winters, four have been excessively cold and one the mildest (excepting the mud blockade of 1877–8) for 25 years.

The season opened with the appearance of the robin March 1st. April 7th commencement spring's work. April 25th ice; also May 22d and 23d. May 16th the first strawberry bloom. June 16th first ripe Crescent and Wilson strawberries.

The season gave a fair crop of strawberries and Turner and Brandywine red raspberries; also of Gregg, Souhegan, and Onondaga black raspberries. The Cuthbert red raspberries were so badly injured that they gave but little fruit.

Owing to the excessively hard winters of 1880, 81–82 and 1882–83, the orchards all over our state began to surrender; some of our old and tried varieties, which we considered iron clad, went down in the grand smash.

We find nothing left that is strictly iron clad as to winter. Golden Russet and Willow Twig come nearest this of anything. A few others on our list may do for timber ridges, lake shore regions and the mountains of Baraboo, but for the general farm location we have nothing left that is perfectly reliable, after you name the bitter crabs and Duchess of Oldenburg, Fameuse and Wealthy,—not a winter kind to tie to. The tree fruits of 1883 were very light and badly injured by the curculios and gougers.

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Grape vines that were properly cared for set a heavy crop of fruit, but the frost of September 7th, 8th and 9th ruined the entire crop.

Blackberries that were covered gave a very fine crop of fruit and brought good prices. The latest kinds were caught in the frost of September and did not mature the late fruit. Blackberries that were not protected gave but very light crops if any fruit at all — even Snyder and Stone's Hardy were killed to the snow line. Winter set in November 14th, but the plows ran some up to December 14th. The winter show of fruit at Green Bay was the most cheering sight of the season, showing more than ever the adaptation of soils to fruits. Elevation and lake protection for success in horticulture!

As might be expected, the season of 1884 only revealed the combined efforts of two hard winters, and the clearing from nearly all our orchards of a large proportion of our old standards.

Spring opened with the appearance of the robins and wild geese, March 17th. Dug a few plants the 22d, and commenced spring work March 29th. Snow April 7, 8, 9 and 20. 21st, ice one-half inch, and ice the 16th and 29th of May, killing from one-fourth to one-half of the strawberries, and all grapes, except in favored and high locations. Raspberries did not suffer as badly as the winter of 1882 and 1883, and Cuthbert gave a fair crop; but blackberries, uuprotected in some places, did not give fruit enough to pay for the picking. September was cool and the first week in October exceedingly hot. Ice October 9, 23, 24 and 25, and winter set in November 23d.

What few apple trees had survived the last four hard winters did their best, and in some sections apples were very plenty, showing more than ever the necessity of adaptation to soil, and the value of elevations and lake protection — our lake shore region producing very fine R. I. Greenings, Jonathans, Baldwins, etc., which sold at one dollar per barrel direct from the orchard, *nice, selected,* hand picked fruit.

The finest fruit in this district was grown in Walworth,

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Kenosha and Racine counties, on the clay and timber ridges, and the finest fruit in our state was from the Baraboo hills, Green Lake and Waupaca counties. We readily see why Baraboo succeeds so well, but why Green Lake county should grow such nice Grime's Golden, Blue Pearmain, etc., is beyond our horticultural arithmetic. We can understand why Kenosha county can grow Greenings, but cannot account for the success of apples in Waupaca county.

Year after year we find mildew, blight and insect depredations more and more prevalent. I am convinced that in my district one-half of the apples, cherries and plums have been injured by the curculio, gouger, and codling moth. Many of you are familiar with the failure of Stickney's five hundred Duchess, which ought to have given 2,500 bushels of choice fruit, and he got just twenty. The soil and high culture may have something to do with the failure, but I think nine-tenths of the failures are caused by the apple gouger, and I consider him the worst insect we have to contend with. From experience and observation I am satisfied he cannot be reached by poison; that stock feeding, hand picking and the jarring process are our only remedies. The members will pardon me for rambling outside of my district, but this insect pest with all others must be met, and I know of no way unless we experiment and report. New York and Iowa both claim they can be reached by poison. I have tried poison for two years, came near killing a man, but don't know of a gouger that I hurt.

FIFTH DISTRICT—E. W. DANIELS, AURORAVILLE.

So far as I am able to learn, the number of fruit trees planted last year is smaller than that formerly planted, but the varieties are more carefully selected. Some people are learning swindlers.

The effect of the climate on fruit trees has been less severe for the past two years, with the exception of continued damage by summer winds in time of fruiting. Ten years ago the cold killed the oaks on the "openings" near here. Last week the mercury went to about 40° below zero, but I have not looked for the effect on fruit.

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Apple orchards were less troubled by insects last year than for several years, if, indeed, they have ever been so exempt. There were no caterpillars except the late leaf-rollers, which we usually have. The caterpillars on my black walnut were less numerous than they have been since I first noticed them, four or five years ago. Codling-moths and apple-worms were few, and there were few, if any black scabs on the Fameuse and other varieties usually affected. Rabbits were also less troublesome than usual.

Wood-growth on the apple was a third greater than usual. I have a cion of the Northwestern Greening, four feet long. Top grafting is growing in favor with me. In 1879 I put top grafts into thirty crab trees. In 1883 some of them bore a half bushel of dwarfish apples apiece, but in 1884 many of them yielded a bushel each of such varieties as the Northwestern Greening, Pewaukee, Wolf River and Duchess. These grafts are all united perfectly. A few of the Pewaukees died at the top but the others are all healthy and full of fruit spurs.

Small-fruit culture is on the increase, while the quality of the fruit is being improved.

Apples are abundant in Green Lake county, and not scarce in Winnebago county and the east half of Waushara county. Shipments from Ripon, as I learn, were 3,400 barrels, and 1,200 were shipped from the town of Aurora, in Waushara county.

I am not acquainted with Marquette county, but have received the following letter from Mr. Borst, of Princeton:

PRINCETON, WIS., December 13th, 1884.

FRIEND DANIELS, Auroraville, Wis.:

Dear Sir: — In replying to your inquiry of the 11th inst., will say that in the west part of Green Lake county there are quite a number of old orchards in very fair condition. Many new ones are quite promising. The cultivation of small fruit seems to be limited to the home demand. Of Marquette county, I must say that the south half of the county seems well adapted to apples as the growing orchards testify. The north half being composed of lighter soil the

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trees die out much more than south of Buffalo lake. And yet the people in the north are trying hard to have orchards. In the vicinity of Westfield there are some very fine ones. Mr. Lyman Cook, just north of the village of Packwaukee, has an orchard of two or three thousand trees, and he is determined to keep his orchard up by filling in the place of dead trees with new ones of hardy varieties. Marquette county fairs show that that county is alive and progressive in fruit growing. As fine specimens of apples are exhibited at their fairs as at any which I attended. Small fruits are only raised in small patches.

Taking the territory of which you inquire as a whole, I must say that the people are making fair progress in horticulture. Any further information will be freely given at any time. Yours very truly,

J. O. BORST.

EIGHTH DISTRICT — E. G. PARTRIDGE, ROBERTS.

The district assigned me is so extensive that I have neither been able to visit nor obtain accurate information in regard to a large part of the same. My own observations have been confined to the valley of the St. Croix. Throughout this valley but little attention is given to apples at present. Repeated failures have so discouraged most experimenters in this direction that they have either abandoned the effort entirely or have excluded from their orchards all but the hardiest of the Siberians — mostly the Transcendent and the Hyslop. The Duchess was planted quite extensively a few years ago, and many of the trees lived to bear several crops, but they have nearly all gradually succumbed, and as a rule, have not been replaced, except by the varieties above mentioned. A few Wealthy and Whitney's No. 20 have been set, but neither is quite hardy. The latter will generally succeed in favorable localities. Our main dependence for the future orchard must be upon seedlings raised here, or upon the newer Russian varieties introduced by Professor Budd.

As to small fruits — raspberries and blackberries so abound in the forest region of this valley, that but few think it

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worth while to attempt their cultivation. The Blackcaps are not hardy here. Turner and Philadelphia are cultivated to some extent. The Turner, in my judgment, is the most reliable. The Snyder blackberry has been tested to a limited extent, but is not safe without winter protection.

The cultivation of strawberries for home use and near market has received considerable attention, and is reasonably successful. Crescent and Wilson are the most popular varieties, though the latter is apt to winter-kill unless carefully protected.

Grapes are grown to a very limited extent, though in many localities they might be made, with careful winter protection, a sure and profitable crop. Mr. Nichols, of Prescott, planted two or three acres of Concords and Delawares a few years ago and realized handsome returns from the same, but I am informed that this vineyard has of late been neglected and is no longer productive.

The present winter has been the most severe ever known in this region. Four times the temperature has fallen below —40°; once, January second, to —48°. Whatever tree or shrub comes out alive next spring may be considered truly "iron-clad."

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PROCEEDINGS OF THE SOCIETY

AT ITS

MEETINGS IN 1884--5.

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In Memoriam.

Mrs. Charlotte E. Lewis, late secretary of the Wisconsin State Horticultural Society, died at her home in Madison, August 16th, 1884. She was born in Carbondale, Pa., November 23d, 1834, and was the only daughter of Addison W., and Cynthia Clark. In her childhood, her parents removed to Battle Creek, Michigan, where she was educated in the public schools and a female seminary there located. Two years after the death of her father in 1852, the family removed to Madison, Wis. In 1858, she married the Hon. Henry M. Lewis of this city. During a period of nearly twenty-six years no happier home could be found in this community. Their children numbered three, Lottie Breeze, Jessie R., and Sophia M. Lottie, the eldest, died nearly two years ago.

For thirty years a resident of Madison, Mrs. Lewis became widely known and highly esteemed in social circles; she was alway active in deeds of benevolence and kindness, zealous in literary and horticultural pursuits, and was an ardent admirer and student of nature's works. She early became an active worker in the Madison Horticultural Society, which, during the flourishing period of its existence from 1858 to 1873, did so much, not only in beautifying the city, but in awakening a more general interest in horticulture in the surrounding country. This society held forty-one public exhibitions of fruit and flowers, in nearly all of which Mrs. Lewis was a prominent exhibitor, and generally obtained first premiums on her exhibits. Being a ready writer on themes which she relished, she contributed many useful and interesting articles relating to horticulture, which are published in the volumes of transactions of the State Horti-

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cultural and Agricultural Societies; and in the winter of 1882 she accompanied the Wisconsin delegates to the Mississippi Valley Horticultural Society meeting at New Orleans, and there read a paper on "Birds in Horticulture," published in Vol. I. of that society's transactions. She has also read several interesting papers before the Madison Literary Club, of which she was a member, and for a while secretary. She was also a member of the Wisconsin Author's Club, a contributor to the *Western Farmer*; and one year she had charge of the Home Department of that paper.

At the last annual meeting of the State Horticultural Society she was unanimously elected its secretary, and engaged in the duties of the office with the zeal and energy that characterized all her public efforts. Under her supervision the volume of transactions for 1884 had been completed and the first copies received from the press for distribution by her, among the members of the society, and while her attention was busily engrossed with various enterprises — organizing a branch of "The Flower Mission" in Madison, preparing for the state fair, and laboring with her pen to awaken an interest among horticulturists in the New Orleans Exposition — suddenly, in the zenith of her useful life, death closed her career.

We will not speak of the sorrow that so unexpectedly darkened the home she had so long made bright and serene with her presence. A sympathizing community mourned; friends and neighbors evinced the keenest grief as they looked for the last time on her familiar features, so beautifully expressive of kindness even in the cold serenity of death. Forest Hill Cemetery, overlooking the city and Mendota and Monona's waters, now holds the mortal remains of our friend; and its native grove-crowned heights, verdure-skirted walks and ornamental shrubbery are in fitting harmony with her own ideas of nature's beauties and the noble art she loved.

Her life, in which many had an interest, furnished material for profitable reflection. With the cares of a family to which she was fondly devoted, she found time for mental culture, allied herself to various associations, and worked in

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them with persevering industry, striving to infuse into others the spirit and zeal requisite to achieve success in undertakings. Generous to a fault, she lavished hospitality with a most liberal hand and won steadfast friends among the many who knew her. She was endowed with ambition which, governed by excellent qualities of mind and heart, drew much of its inspiration from contemplating the beauties and mysteries of nature's works; it also engaged her in deeds that benefit mankind; it enlivened and instructed social circles of culture and refinement with kindly regard for all; it disarmed envy; it shone with soft and mellow light by the bedside of the sick and dying and touched tenderly the heart chords of the inmates of hospitals and asylums, and waked them into hopeful life. Her career, so strongly marked by genial and benign influence, when ended still leaves a radiant light that gleams

"Like twilight hues when the bright sun has set."

In this radiance the members of the Wisconsin State Horticultural Society will, as time passes, cherish and honor her memory.

J. M. SMITH,
B. F. ADAMS,
WM. TRELEASE,
Committee.

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PAPERS READ AT THE MEETINGS OF THE SOCIETY.

SUCCESS.

BY MRS. A. A. ARNOLD, GALESVILLE.

"It will not do to give yourself to be melted down for the benefit of the tallow trade. You must know where to find yourself."—*George Eliot.*

This may seem a homely assertion, yet there is much of truth in it, much of importance to us as fathers and mothers, as brothers and sisters.

It does not mean that we must not be unselfish and generous, manly and noble; yet much of our happiness, much of our success in life, depends upon true independence of character, upon assertion of self.

When we pass in review the early history of the American people, we find that though poor, financially, they were rich in men and women of rare intelligence and those sterling qualities so essential to the success of any government, and especially a republic. They were of the type that self-denials and privations could not dwarf. They made the opportunity to relieve their children of the bondage that was bearing them down. In those days the opportunity to perform a kind or noble act was considered a providential indication of duty, and the best discipline of life was in promptly seizing such opportunities. We can but rejoice in what their patriotism has gained, and it would be well for us to act more readily from such pure motives.

'Tis the ultimate object of education to enable us to act well our part, to think for ourselves, to be men and women in mind as well as in stature. We seek knowledge as a means to an end. We mean not merely a knowledge of books, but of men and things, with an aptness in making it available in whatever pursuit we follow. Few can afford to be simply men of letters, therefore it should be thorough and practical to successfully fit its recipient for the struggle

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of life. It should teach us to observe, to use our success and in a measure our imagination, give us at a glance an insight into the "situation." In Mrs. Stowe's biographies of eminent men, we notice their advantages were varied. Salmon P. Chase having finished his college course, and being given a spade by his uncle, understood fully what it meant. He did not look lovingly at his soft white hands and cast it aside. The world was before him, he had work to do. The discipline enabled him to improve his opportunities, and he proved of sterling worth as chief justice and secretary of the treasury.

Henry Wilson served an apprenticeship of eleven years on a farm. He applied himself "to reading by fire-light, by twilight and on Sundays," till he was familiar with history, geography, biography and general literature, thereby storing his mind with a knowledge of incalculable value, as his public career of usefulness testifies. In these two illustrations the advantages differ, yet very nearly the same results were obtained.

There are none of our farmer boys that can not read as did Henry Wilson if they will; and if you cannot have the advantage of school life you may know more of the world and the practical, and this is no small thing to learn. Earnest endeavor and intense application are certain to bring rich reward. Some seem to rise to distinction through no merit of their own, but by a combination of circumstances.

To-day, as public sentiment is, 'tis easy to see that had Mr. Cleveland's life been pure, or had Mr. Blaine's public record not been questioned, either one would have been elected to the presidency by a large majority. When young we are sometimes reckless of what we do, forgetting that when we are old we live in the past, and that bad deeds, missteps, are dark blots upon our lives that we then have time to bitterly regret.

> "How long we live, not years but actions tell,
> That man lives twice who lives the first life well."

Could we walk steadily onward 'til we reach the standard we covet, not take excursionary skips and hops upward, then

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as regularly flounder and flop down again, we would retain at least our self respect.

We must not expect to attain perfection in all directions, without meeting discouragements. Commodore Vanderbilt said, "there's no secret for success in life; all you have to do is to attend to your business, and go ahead,—except one thing, never tell what you are going to do till you have done it."

Let me ask you young gentlemen, do you know where to find yourselves? I'm not surprised that many of you think you know exactly what is best for you, without the advice of parents or friends; but with a few more years of experience you will ask with all sincerity, and an honest desire to make the most of your manhood, what vocation you are best fitted for naturally, and consequently which you can be the most successful in.

Catechise yourself severely as to motives and fitness. Having finally decided, fight your way through all obstacles. Do not be alarmed if duties and uncontrollable circumstances seem to hedge your path; become familiar with the most trifling details; gain information from all sources possible that have any bearing upon your chosen avocation, for only in this way can you hope to be master of your business.

The extremes of certainty and uncertainty are very great, and you will often feel quite at a loss to know just what will be to your advantage. If you are fresh from college, we hope you know that true learning makes a man humble and modest, and that your education is but the stepping stone to further development. Let the basis of your every action be a principle of right, being right, doing right. Never think that a good end can possibly justify bad means. What is bad is bad, let it result as it will, and what is good is good, whether it leads to the gallows or a throne.

Ever do then what is right, ever say what is right and true, and you need trouble yourselves little about consequences. The want of principle causes many failures, its presence creates confidence in those we have to deal with. In a word, whatever convenience may be thought to be in falsehood and dissimulation, is soon over; but the inconvenience of it is perpetual, because it brings a man under

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an everlasting jealousy and suspicion, so that he is not believed when he speaks the truth, nor trusted when perhaps he means honestly. When a man has once forfeited the reputation of his integrity he is fast, and nothing then will serve his turn, neither truth nor falsehood. "We can not retain for any length of time the confidence of our fellows without deserving it, nor win laurels without earning them, nor enjoy respect without meriting it."

You must feel responsible for you doings, for in this way you learn foresight, patience, self-control; could you get everything you want by the simple asking, you would be but a moral weakling; 'tis vastly better for you that you are obliged to study and labor, and wait — work out your own fortune.

When divested of this responsibility you are deprived of the greater part of your usefulness, you are but a machine, into whom God has breathed the breath of life and given brains and sympathy.

So find out what you want to be and do, feel that the world wants you and your works. As Mr. Burdette expresses it "take off your coat and make success in the world. Don't be afraid of killing yourself with over work; 'tis rarely done on the sunny side of thirty. They die sometimes, but it is because they quit work at 6 P. M., and don't get home until 2 A. M." Habits of industry are a great safeguard against temptation. Courage and work invigorate the whole system and lift one into a purer atmosphere; the most earnest workers talk little about the exhausting labors of their profession.

The busier you are, and the less liable to fall into the hands of him who employs the idle, the better satisfied will the world be with you.

The fireside department of our agricultural newspapers is for the exchange of ideas upon familiar subjects, but I fancy the editors chuckle in their sleeves at many of the common-place contributions, and must have a poor opinion of the literary taste of their readers if they suppose that such themes will satisfy their cravings for information. We can become familiar with a phase of human nature by

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their perusal, yet the general reader will not be sympathetic enough to appreciate their trials; will not care whether Dolly V. wears a Mother Hubbard or a Jersey, whether they choose to live on gruel or good, substantial food, or whether they think it right to dance or paint their faces. Many of these correspondents could receive suitable advice from almost any of the good, womanly mothers of the neighborhood, and not be obliged to inflict the newspapers. We appreciate the impulse that prompts the inquiries, but question the ability of the writers and the appropriateness of making them so public. Others complain of miserly fathers, saying they haven't a penny to call their own, with which to cultivate their taste or beautify their homes, though, automaton-like, they move from morning till night for the general benefit. Such instances are getting less frequent where a father carries out the patriarchical idea so completely. If this niggardliness has grown with the years and neither love nor pride can change him, you are indeed unfortunate. True economies are worthy of all praise, but when the spirit is avarice, dwarfing those that should be near and dear, we have no patience with it.

This unrest signifies better times. If you were content you would scarcely exert yourselves in the direction needful for a change. If you are so modest as never to have an opinion of your own, why some will think for you perhaps to your disadvantage. The other extreme would make one notorious in the neighborhood.

Whatever of education or advantage is given the young man, as rightfully belongs to the young woman, and every day proves more fully that she can fill positions of responsibility with credit. We have often heard it argued that young women will never make as good clerks or secretaries as men, that they only resort to it for a time while waiting for a husband. I have heard it stated by those who ought to know, that they are more contented, more cheerful, less restless, more to be depended upon, and less likely to become rivals in the business of their employers. It is expected that the young men will do business for themselves as soon as they are proficient. She is found to be more willing to

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do as she is asked, and as for punctuality, endurance and regularity, she has won a reputation in the face of the noisy disputants, who for centuries have argued that nature especially unfitted her for the exacting demands of business life. Give the girls a chance and the more familiar they become with it by being brought in contact with business, the better will they be fitted for its duties.

Our women in journalism are grand successes. In science, there are many of acknowledged worth. Many are notably successful as physicians, with a professional income equaled by but few of the great 'medicine men.' As lecturers, many are popular, worthy of their hire. As artists, we may well feel proud of their work. As lawyers, some are demonstrating that they can succeed, and many assure us that they are meeting with greater courtesy, kindness and business success than they expected.

We know that women have worked in these fields only for a comparatively short period. When our fathers, husbands and sons went from farms, counting houses, and business offices, after the firing of the historic first gun on Sumpter, the American woman's opportunity came, and into the vacant places went mother, wife and daughter, and proved that sufficient unto the day was the strength given.

It will not do to be spiritless and indifferent in what you undertake, if you expect to succeed. The force of habit is "as a cobweb — a thread — a twine — a rope — a cable." If in the right direction your success is assured, for your course through youth will determine your course in maturer years, as regards the energy and push with which you apply yourself. Fortunate are those who have happy homes, and their names are legion, where wife and daughters are blest with the best and purest love of noble manhood. There are many not so fortunate. To those we would say, let the lesson of your youth, the life your mother leads, be a warning to you if you ever think of having a home of your own. If as son or brother, a young man is uniformly considerate of the feelings of his mother and sisters, and if found exercising care for their comfort and pleasure, it is strong evidence

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that he will not be forgetful of wife and daughters in the years to come.

It was this thoughtfulness that suggested to Mr. Woodruff the idea of a palace sleeper, that his invalid wife might ride with more ease and comfort. Some of the brightest thoughts of the age owe their creation to the loving desire to cheer the sick room of a suffering wife. Much of the success of the home depends upon the courtesies, acts of love, words of approval and cheer. Might as well try to warm a room with a fireplace and pair of silver plated andirons, and no fuel and fire, as to make a home worthy the name without them.

In a curious paper, entitled, "Advice to the Women and Maidens of London, 1676," we find suggestions so practical for the women and maidens of to-day, that I will quote from it. "Ladies and Gentlewomen—Permit one of your sex to give you, as far as her small knowledge will reach, some hints to the right understanding and use of accounts—an art so useful for all sorts, sexes and degrees of persons, that next to a stock of money, wares and credit this is the most necessary thing. Nor let us be discouraged in the inspection thereof, by being bid meddle with our distaff. And for telling us that the government of the house appertains to us, and the trades to our father or husband—under favor, the one is to be minded, and the other not neglected; for there is not that danger of a family's overthrow by the sense wanting its right relish, or the tables or stools misplaced, as by a widow's ignorance of her concern as to her estate; and I hope husbands will not oppose this when help and ease is intended to them whilst living, and safety to their name and posterity after death. And let us not fear that we shall want time and opportunity to manage the decencies of our house, for what is an hour in a day, or half a day in a week, to make inspection into that that is to keep me and mine from ruin and poverty. I never found this masculine art harder or more difficult than the effeminate achievements of lace-making, gum work or the like, the attainment whereof need not make us proud, and God forbid that the

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practice of an useful virtue should prompt us to a contrary vice."

We can not spend the small portion of time necessary to the right understanding and use of accounts in any better way. Instances have come to my notice frequently of late where, the husband dying, wives and mothers have been left as helpless as their children, and more to be pitied, in utter ignorance of their affairs. When the estate passes into the hands of the executor or administrator, she is wholly at his mercy; being ignorant she is suspicious, and knows not whether it is managed well or badly. How much better for those interested had the wife been familiar with the business of her husband and had no third person been necessary to take charge of his wife's purse.

Whatever tends to make our home life purer and stronger is doing the best and noblest service for society. Society has claims, composed as it is of individuals, of families with mutual interests. The higher the standard of education, of morals, the greater the energy and public spirit of its citizens, the greater their usefulness, as this is commensurate with their thrift and intelligence. We are appreciated and respected for our success. The more fully we work in unison the greater the results obtained. The sooner learned that the man honors his calling, and not the calling the man, the better; and no position is an honor to a man or woman unless they can fill it well. The American people have a respect for official position, but not unfrequently detest the man who holds it.

No institution, no state, will go on of itself and hold its footing in the nature of things while its guardians, or trustees are dozing on their watch. The future success and prosperity of our country depends more upon the character of the men who cultivate her soil, than upon those who shall draw salaries from her treasury. Put intelligence upon the farm, and you will have distinction in the Cabinet. A successful scientific agriculture infuses life and health in the whole body politic, and strengthens the arm of State. By the light of success triumphing over failure, we stagger on toward truth. As Archimedes once boasted, "give me a

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place on which to stand and I will move the world." The home is that place of vantage ground, the fulcrum on which to rest any lever of progress. Infuse into the home principles of right and truth, commence there any reform, and you sway the nation.

To realize in actual life a home having an atmosphere of comfort, taste, intelligence, generous impulse, kindly feeling, integrity and moral principles, has been the best effort of the ages; success in this, the measure of progress.

The beauty of successful lives, of trustful, hopeful, free-hearted, charitable lives, is one of surpassing loveliness. Those lives shed their own incomparable fragrance, and the world knows where to find them.

THE FARMER'S NECESSITIES.

BY MRS. VIE H. CAMPBELL, EVANSVILLE, WIS.

The necessities of farmers! Ah me! I fear I have undertaken a prodigious task; one requiring herculean efforts, for we, as a class, individually and collectively, are possessed of unnumbered necessities.

Our wants so many, our supplies should not be few.

Now as Necessity is a time-honored parent, we should endeavor to find numerous worthy inventions for a remedy to these ills we farmers are heir to, and, as there are many here to-day representing other branches of industry, if among my suggestions for relief I should say some things that may seem to you as missiles hurled, I crave your forbearance, hoping you will remember that they, like the boomerang, will not fail of returning to the source which gave them impetus.

It has only been a few years since we were considered to have any needs, except plain food, plainer raiment, and the privilege of allowing our girls and boys to attend school a few months, oftener a few weeks, each year, in an uninviting, poorly warmed and poorer ventilated school-house; to advance each term but little farther than the preceding one.

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And we, ourselves, have only realized it in a dreamy, half-dazed sort of a way; and where rests the blame? Partly, yes greatly, though not wholly, on ourselves. We should have stepped into our niche and proudly held our position, instead of allowing ourselves to become crowded out by the wide-awake, more ambitious ones, until we farmers have only a "rut" in the highway of life. I think the first remedy should be found at home.

How often do you hear the remark, "Yes, it is a good house, a nice, well-finished house for a farmer"? Now, I could never understand why a farmer should not have just as nice a house, providing always, that his revenue is sufficient, as one who has chosen some other profession — surely not because of its not having been hard earned.

I would have the home — that place which is the training-school in the truest sense of the word, an object of beauty in all its surroundings. We may make it so, and yet do it very inexpensively if we so determine. Nature has dealt with a lavish hand to us who have chosen a rural occupation, giving us hills and dales, and, withal, more than all, space with which to make a beautiful landscape. And here let me plead that our plot for a lawn may not be so limited. Please remember that we are not restricted to fifty or a hundred feet frontage. Remove some of the unsightly old fences that are too near an obstruction to our range of vision. Tear down or move some of the dilapidated old corn cribs. Change the cow yard that is now between the house and barn, to some equally convenient locality, where we in the house shall not be annoyed by the millions of flies that follow in the train of Brindle and Crumple, and let us have the space for a nice, well kept lawn, that shall be "a thing of beauty and a joy forever." Try it brother farmers, and see what an incentive the change created by the small amount of labor you have thus bestowed will prove to stimulate those in the house, who have fewer opportunities than you of getting away from "the smoke of their own chimneys," to feast their eyes on the beauty of the surroundings of perhaps some lovely well-kept place in town.

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And now, while at work on the lawn, let me ask that you will cut down or else well trim the the trees that hide the view, and let God's glorious sunlight in, chasing away the shadows from our homes as well as our hearts, thereby driving out disease and dampness lurking in the dimness, caused by the brawny branches of those great trees in too close proximity, remembering that trees, like everything else, are only blessings if not indulged to an extreme.

I have in mind, now, a farm home that might be pretty, if it was not completely hidden and darkened by the dense grove of trees that surround it; and every time I pass the place, I wish I had the power to impress upon its owner how beautiful it would be, could he only be persuaded to sacrifice many of those trees, that it might have more the appearance that it had in days of yore, ere they had attained such lofty proportions.

Then I would have the flowers, not in a long row of beds either side of the walk, disfiguring our beautiful lawn, but in some convenient place where they will add to, rather than detract from the surroundings. And, too, the fence — for we must have one, and it is an article of protection, instead of a relic of barbarous nature, as one worthy friend of mine will insist. A hedge is the most beautiful when kept well trimmed, but very unsightly, like all ill-kept things, when not. Then there are the various wire and decorative iron fences, and last, to my fancy, come the pickets. But above all, do not build your lawn fences too high, they may give the protection just as securely, and not be high walls shutting out your own view and also that of the passer-by.

Perchance I have dwelt too lengthily on out-of-door arrangements. Now I'll to the house.

Let it be neatly and tastefully built, though the outlay may not be above a few hundreds. If you have an addition to make to the main part, let it be in the shape of a wing, rather than at the rear of the house with a shed roof; for the improvement in the looks will many times compensate you for the few dollars of additional outlay.

Some person has said that "it is getting to be everything

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for looks in this world." Well, our eyes certainly always have been guilty of the accusation.

Then as the kitchen is one of the principal "spokes in the wheel," let it be roomy and well ventilated. May it be airy in every sense of the term, but above all, sisters, do not let its use become perverted; do not degenerate into the fashion of using it for the sitting-room, for the sake of keeping that honored room closed, only opened to the echo of visiting foot-steps.

Someone has remarked that "a child brought up in the kitchen will always have kitchen manners." That the decorum of a kitchen should not always be good, I will not say, but you all know we have little time to think of aught save our manifold duties while engaged within its walls, but after its tasks have been mastered let us adjourn to the sitting-room and, if we are the possessors of parlors, we will have them built with folding doors, so that when we sew or when we read, when we are in the society of our families, we may enjoy what of beauty it may be our good fortune to collect around us. And let us here record a vow never to allow ourselves to be tempted to furnish a room so nice that it may not always be used and enjoyed by the family.

A feeling akin to sadness comes o'er me whenever I pass a farm-house whose front shutters are all closed, and only from the kitchen, in the rear, comes a feeble gleam of light, proclaiming that the inmates are not all from home, as I at first supposed, but have only shut up the pleasanter part of their house, furnished, oft-times, with luxuries hard-earned and by some denials, withal, to be opened "when some one comes."

O, mothers! if you could only realize that this shutting up of houses is the shutting out of our sons, yea, and of our daughters, too.

It is, I think, truthfully said, that one of the strongest and most common inducements for the sons and daughters of farmers to leave the country for a city life is the neglect of parents to beautify home and teach children to love it because everything around it is more cheerful, more beautiful, more pleasant, and more enticing than any other spot known

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to them. Instead of this, it is painfully true that quite a portion of our farm-houses are, in many respects, exactly such places as children of intelligence, who chance to see or read of the attractions of other places, are most anxious to leave.

Therefore, to prevent the exodus of our children so soon as they are old enough to get ideas of their own, let it be our life study to make them sensible that their home is equal in all the little attractions that serve to make life worth the living, to the homes of other children, and infinitely superior to any gilded saloon the city may boast of.

If our houses are small they are the more easily painted and made to wear an attractive appearance, and therr is no reason because of their smallness, that their interiors should be inconvenient or uncomfortable.

"Make your home both neat and tasteful,
Bright and pleasant, always fair,
Where each heart shall rest contented,
Grateful for each beauty there."

Then we must have music; ever try to cultivate it—it brings a soothing influence; many a sad heart is lightened, many a care brushed away by a cheerful song or a sympathetic air played upon some instrument.

Then books, something to read, good, well selected reading matter; and in our selections we cannot be too careful, for the young eagerly grasp, in their thirst for knowledge, everything within their reach.

Some one has said "Read few books, by fewer authors," and perhaps it would be advisable not to take in too wide a range. But let me urge upon mothers to find more time to read, that they may be better informed, better teachers. She who dare not find time to read a few moments each day neglects a duty to herself as well as to her family.

Let us have games. I can hardly think of any that would be objectionable for the home circle; indeed, we may be sure, if any are forbidden, those are the ones human nature will have the curiosity to learn. In their participation we must all join, for old as well as young need recreation,— then no fear that proper decorum will not be observed.

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I need not suggest to you the cultivation of flowers, for there is not one of us who does not know the refining influence shed by the blooming of one flower, in however rude a cot.

Now, with all these attractions within the reach of all, our homes ought always to be looked back upon, when our children, arrived at maturity, go out to fill different stations in life, as the brightest picture memory hangs upon the walls.

We must teach our children that "there is no place like home," is not merely a song.

We do not expect for a few years, at least, to occupy the Presidential chair, but we hold the scepter, home influence, a mightier power than was ever vested in king or emperor — that of moulding the rising generation, that they may be fully fitted to fill higher places than we now occupy — to uphold the banner of justice to all.

I look upon a love of home, as one of the virtues that we, as a class, are in danger of neglecting, in fact a dislike for home, among the young, is quite too common, and the old homestead is parted from with as little reluctance as an old shoe, and often for the same reason, it is "down at the heel."

"Seek to make your home most lovely.
Home should be a smiling spot;
Such a home makes man the better
In lofty mansion or a cot."

I hope you will pardon me for dwelling at so much length on this theme, for it has ever seemed to me of the greatest importance, — a well ordered home.

In our ambition to add to our resources and extend our boundaries, we become more isolated; from this fact comes one more wide felt want, the lack of organization; that it is supplied in a degree, is true, but it is by no means effectual.

The work of organization should go forward until all producers are banded in one cause, having for our object, mutual advancement in all directions.

After having decided that an organization of some kind must be effected, let your preference of the several orders, each having good for its aim, be for the one whose ritual

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contains the least of ceremony, lest after the novelty has worn off it becomes monotonous, and the object defeated by a long and tedious routine.

You will, of course, deem it necessary that the ladies unite with you in the undertaking.

Do not consider now that the work so "well begun is half done;" do not lose sight of the fact that we are banded together for mutual good, to make us better farmers in the term's broadest sense. We must not depend upon our officers to provide us with an intellectual treat each evening in order that we lose not our interest, but each one of us must consider it a privilege to contribute something entertaining.

I seems to me that if farmers could only be awakened to a realization of the strength such unions afford, they would arouse themselves from the lethargy into which they have fallen.

We lack proper representation; indeed, we have no share of representation at our nation's capitol—and why? We form about three fourths of the population of the United States. You will readily see what proportion of representation we are entitled to. Why do we not have it? Why are we continually sending men of other professions to represent ours, rather than men whose sympathies are with us? Have we sold our birthrights? Shall unrepresented taxation be the largest legacy we leave our children?

Can we not realize that we are menaced with dangers on every hand? Wealthy corporations, like the "Old Man of the Sea," have so fastened upon us, that unless we exert ourselves with a will, they will not relax until we sink exhausted. Oh! that you successful grape cultivators could tell us of some new seedling—some wonderful hybrid—from whose luscious clusters a nectar might be distilled, a quaff of which would so stupefy the monster that we would be able to release ourselves from his clutches.

Let us work with a determination to place men from our own ranks in office, who will come home with honest tickets in their hats rather than suspicious railroad passes in their pockets.

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To those who have labored so earnestly for our cause, and have failed in gaining the success they anticipated,— be not discouraged, you will yet succed. The wheels of progress never turn back, though they may for a time be impeded. And —

> "No life can be pure in its purpose and strong in its strife,
> And all life not be purer and stronger thereby."

PROGRESSIVE HORTICULTURE.

BY J. S. HARRIS, LA CRESCENT, MINNESOTA.

Members and Friends of the Wisconsin State and North Western Horticultural Societies—

To the people of this beautiful city of La Crosse and you the honorable guests of the North Western Horticultural Society, I will say that the greatest part of my life has been spent in the study and pursuit of horticulture. I came to this region with the first advance of civilization, when Minnesota, my present home, was almost entirely a vast wilderness, and before orchards and gardens had found a place here, and when on account of the severity of the winters it was very generally believed fruit culture could never be successfully pursued. This place, which is now the home of over twenty thousand people, who rank in intelligence, enterprise and prosperity equal with a like number on any part of the globe, was a little village of about thirty houses upon a prairie of drifting sand, almost destitute of all vegetation except sand burrs. I came from a land where fruits were abundant and easily grown, and brought with me a great relish for fruits and almost an adoration of flowers and beautiful home surroundings. Thirty-three years have since passed over the scene and a most wonderful transformation has taken place, and during those years I have improved every opportunity to encourage the beautifying of your city and homes by the planting of flowers, fruits, shrubbery and trees about them, and the

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adornment of city and country. And now and in the future, here and everywhere, I am the advocate of progressive horticulture.

Horticulture is defined as the most perfect method of tilling the earth so as to produce the best results, whether the products are objects of utility or of beauty. Literally it means gardening, gardening for pleasure and gardening for profit, gardening of every kind and in every place. Caring for the cheap plants in the window of the poor laboring man's cottage, and the rare and costly exotic gems in the conservatories and bay windows and beautifully laid out grounds of the great and wealthy; growing simple vegetables upon the cramped town lot for the home supply, or upon broad acres for the market; the little patch of the most common fruit, or great commercial orchards; planting shrubbery upon the lawn, shade trees along the highways, and forests in waste places and upon the prairies of the great west, for the benefit of future generations. These all are gardening; so, too, is the keeping up of beautiful parks with shady drives, and the adornment of the grounds of schools, churches, hospitals, prisons and cemeteries — and I will include more, the cultivation of those home plants, your children, in virtue, morality and temperance: to teach, assist and encourage all who are engaged in any of these pursuits is the mission of horticultural societies.

Horticulture is a gracious art which, through all time, has been a symbol of peace; an art joined in closest ties with nature, and her helper in the daily miracle by which she clothes the earth in beautiful garments. Her amiable genius ranges the world with indefatigable industry, and gathers and nationalizes, and adapts to the use of men whatever can regale the senses or sustain life and tempt the appetite. And then comes the application of her art. It is to sow and plant, to prune and train, to transplant and propagate by budding, layering, marking — by cuttings and grafting. There is no other occupation of man that is so ample in its range or so multiplied in its allurements, or that is calculated to affect us with more wholesome influence, or fill us with purer sentiments or holier aspirations.

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The history of horticulture or gardening can be divided into three sections, viz.: the "Ages of Antiquity," commencing with the earliest accounts and terminating with the formation of the Roman Empire; the "Ancient Ages," from the rise of the Roman Empire to its fall; and "Modern Times," from the close of the second period to the present day. In the first of these periods we have the Garden of Eden, Noah's Vineyard and the other gardens mentioned in scripture and tradition. The history of them that has been handed down to us is meager and mythical and we have no convincing evidence that they or the Gardens of the Gods in any manner excelled or anywhere near equalled the most ordinary gardens of our day. In a very early age Persia and Assyria were noted as being the most refined and enlightened nations upon the earth, and their gardens were famed for their romantic and picturesque situations. Persia is credited as the native home of most of the popular fruits in cultivation at the present time and its gardens were filled with fragant flowers, cooling vegetation and refreshing fruits. The same may have advanced to Egypt and had probably been grown there from time immemorial. That the Egyptians in the time of the Pharaohs held the tilling of the soil in greater veneration than any other employment we are led to infer from the words of instruction by Joseph to his brethren before presenting them to Pharaoh, "And it shall come to pass when Pharaoh shall call you and shall say 'what is your occupation?' that ye shall say, 'Thy servants' trade has been about cattle from our youth even until now, both we and also our fathers: that ye may dwell in the land of Goshen; for every shepherd is an abomination unto the Egyptians." (Genesis XLVI., 33-4.)

As they advanced in wealth and civilization the Greeks appear to have copied their architecture and gardening from the Persians. Ancient history gives us but little light upon the subject, but one author says, "They first built stately residences sooner than they came to garden finely," as if gardening were the greater perfection, which is a truth and history to-day repeating itself in this country.

The second or Roman period is the first that boasts of any

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very interesting writers upon the subject of horticulture; and most of their works have been lost. Among those which come down to us are the writings of Cato, Varro, Pliny, Virgil and Columella; and the earliest gardens mentioned in Roman history were those of Tarquinius Superbus, the seventh and last king, and of the farmer and wealthy general Lucullus, the latter said to rival those of eastern monarchs in grandeur and doubtless patterned after the traditions of the "Gardens of the Gods."

The accomplished nobleman and philosopher, Pliny, possessed two villas—one for summer and one for winter residence — which have been very particularly described, and they are said to have created the taste for, and given the style to, European gardening for a century and a half, and to have had a striking resemblance to the Dutch and French gardens of to-day, with their little flower beds and walks bordered with box and other trees cut to fantastic shapes. Gardens filled with roses, violets, and other sweet-scented plants were in great repute among the ancient Greeks and Romans, but unless there was a great deterioration in plants during the dark ages that followed the decline of the empire, they must have been tame affairs compared with some modern gardening, for the improvement in such plants during the last hundred years has been marvelous.

The third or modern period of gardening extends from the fall of the Roman empire to the present time. During the earlier part of this period Europe was sunk in a barbarism of almost midnight darkness, and during that period the noble art was only preserved by the attention paid to it by the monks; and it was not until the fifteenth century that it was revived, and, with the other arts, began to attract attention. The most celebrated gardens of that time were those of Lorenzo dei Medici, and the most remarkable one that of the royal residence at Milan. The park contained three thousand acres, and, besides, there were gardens; of culinary vegetables, and botanic and fruit gardens, but there is no evidence that they contained anything better than the primitive varieties in cultivation by the Persians ages before, and they were the possession of the great and wealthy only. Dur-

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ing the following centuries the science of gardening seems to have broken loose or escaped beyond the grounds of kings and noblemen and spread through almost all Europe, but was as well understood in France as in any country on the continent. In later years the work of bringing the art to the greatest perfection seems to have started in the British Isles. The stimulus that has since carried it vigorously on seems to date back to the sixteenth century, previous to which time but little is known of its development, and the advance has been much more rapid since the construction of conservatories has been practiced for the protection of tender and exotic plants. And at the present time, in many of the countries of Europe, young persons are trained up in the art of gardening, and are as thoroughly drilled and educated as men who are to follow any other profession.

In our country a high grade of horticulture is but in its infancy, but most wonderful advances have been made within the last fifty years, even far beyond those of wealth and population, and present indications are that the time is near at hand when the gardens of America shall surpass those of all other countries. It has here enlisted ability, skillful energy and knowledge to push the work and meeting here, as it will, the approbation of all classes of people, it is bound to lead men to distinction as surely as any other profession. Of what greater names can our nation boast to-day than those of Wilder, Downing, Thomas and scores of other kindred spirits that are to-day household words in every American home? Horticulture, if broadly pursued, is in itself an educating power—and no other pursuit can surpass it for training the powers of observation. The mind of the true horticulturist is always on the alert to detect the working of the principles that govern nature's laws and carry them to their practical application. The world is to-day indebted to horticulture more than any other one art for its civilization, refinement, virtue, morality and true Christianity; and as the years roll on and population increases it will continue to gain importance.

Horticultural societies are a means of usefulness that should be encouraged and liberally sustained and they are

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yet in my opinion destined to exercise an influence for good hardly surpassed by any other society. If this society shall be sustained as it ought to be by the citizens of the city and the farmers and gardeners in the adjacent country, it will accomplish a vast deal of good. If sustained it is bound to kindle horticultural tastes, and diffuse a love for the cultivation of fruits, flowers and vegetables, that shall exercise an elevating influence upon all of your people, and will also supply your tables with the most wholesome and appetizing food. It will incite emulation in and around your homes. It will create for you parks and pleasure grounds, where the weary sons and daughters of toil may occasionally resort to get away from the monotonous hum of machinery and the turmoil of business, and breathe God's pure air and commune with nature. As horticultural tastes are improved and more and better fruits are placed within the reach of the masses, many of the temptations that allure the youth to haunts of vice and intemperance will be disarmed or removed. It will continue to add new beauties to your city, and as they unfold their benign influence will reach out far into the country on every side. The city of La Crosse could not do a wiser thing or make a better investment than to give the North Western Horticultural Society substantial encouragement, even to the extent of furnishing a hall for its meetings and exhibitions, and providing for the expenses of weekly or monthly meetings and exhibitions. Judicious and well directed liberality would promote her honor and extend your influence. Finally what I say to you citizens of La Crosse, will apply equally to every city and village in Wisconsin. And now let us ever remember that the mission of *Progressive Horticulture* is not narrow and personal, but generous and broad, and that our rewards shall come in a consciousness of having bettered the condition of our race; and let the watchword ever be Onward! until city and country shall be transformed into a second Eden.

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HORTICULTURAL MUSINGS AND OBSERVATIONS ON THE PAST.

By A. J. PHILIPS, Blount, Dakota.

There is a saying "'Tis sweet to be remembered." I feel the force of it this winter, and for fear I may be forgotten I write a short essay on the subject named, yet trust that some one who wields an able pen will pursue the subject in the future, and perchance advance some thoughts and ideas that will guide us in our labors in this our favorite calling. Five hundred miles away, making a residence to perfect a title to some of Uncle Sam's dominion. I see that I must deprive myself the pleasure of meeting with my Wisconsin and Minnesota horticultural friends this winter, but I shall look anxiously for a report of your success at the great New Orleans exposition, and sincerely hope that when another year rolls around, I will have the pleasure of again meeting with you. Absence from Wisconsin the past season will cut off my report on observations, so that all I can give will be a few items relative to my own orchard. In the fall of '82, my orchard was loaded with fine fruit. Many of the young trees, more especially the Wealthy, bore too heavily, so that to ripen the fruit exhausted the trees to such an extent that they were poorly prepared for the coming winter. Consequently in the spring and summer of '83, many looked weak and sickly, as J. C. Plumb can testify. Through the winter of '83 and '84, I was corresponding and inquiring with a view to looking up a more favorable place to pursue this, my chosen calling, where perhaps the climate was not so severe and the losses not so great.

In the spring of '84 I started west through Minnesota and Dakota, intending to visit Nebraska, Missouri and Arkansas before my return, but on reaching Central Dakota I found some choice land still vacant and concluded it would pay me to stop here at least one season. The climate and soil are very desirable and if the rainfall is sufficient, it will be a desirable country when it is cultivated and forests are planted and cared for. Fruit I think will do as well here on

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the Missouri slope as in Central Wisconsin. Before leaving Wisconsin I rented my farm and orchard to a careful man, and when he wrote me in May he said, Oh! if you could see the apple blossoms on the hill, you would not exchange it for the whole territory of Dakota. My thoughts then often wandered back to the orchard and to the associations connected therewith, and when September came and they began to ship Tetofsky, No. 20, and Duchess, I was more than pleased. Such magnificent, to me, Duchess I had never before raised, they were the admiration of all who saw them. In September I returned to Wisconsin and spent nearly four weeks packing and shipping apples west and attending the Wisconsin state and the La Crosse county fair. At the last named place we made a fine showing. Spent most of October here in Dakota and November in Wisconsin cutting cions, digging trees and preparing for winter. Never saw the young trees of Duchess, Wealthy, Wolf River, McMahan's White and Peach apple look more promising. This gave me new courage. I adopted the plan of picking two weeks earlier than I had formerly done, for two reasons. First, they stood shipping five hundred miles better, and second it gave the trees two weeks more to prepare for winter. Had a nice crop of apples and wherever I shipped the Duchess and Wealthy they brought orders for more. The Wolf River was also much admired and I have concluded I have not trees enough of this variety.

In my musings I often think of my individual losses, but I find they are small compared with our societies' losses in both Wisconsin and Minnesota. Our Mrs. Lewis's intelligent and pleasant countenance will no more be seen, nor her excellent papers be heard in our halls. That voice is still in death. When I turn to our report for '80 and '81, page 38, and peruse that valuable paper on the Psychology of Country Life, I can but wish that that production could be in every farmer's library in our land. Those appeals for the overworked housewife should not go unheeded, and in the same report is an interesting paper on the Birds of our Gardens, that will bear reading and re-reading. And while the east has lost her John A. Warder, our sister state Minnesota has lost

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her John A. Warder in the person of the Hon. L. B. Hodges, of St. Paul, the champion of forestry in the west and the friend of the cottonwood. When he rose to read his last article at their annual meeting in 1883, it was the writer's privilege to hear him. His voice was stern, his manner easy, and his arguments practical, soon convincing his hearers that he fully understood and was in earnest in the important subject he was handling. His death was not only a loss to Minnesota, but to the treeless region of the west and northwest. But his labors are done and a great man has gone to his rest. His last paper in the Minnesota report for 1883, should be in the hands of every farmer and tree planter in the west. In my musings I think of the many pleasant visits I have enjoyed in Illinois, Minnesota and Wisconsin with my horticultural friends. When I hear market gardening discussed or large strawberry crops mentioned, I think of our worthy President; when I see or hear of the Wealthy, either fruit or tree, I think of my esteemed friend Gideon and his amiable wife; also of the late Dr. Jewell, who sold me my first trees of that variety, and of Saul Foster who first called my attention to it. Who can say what Peter M. Gideon did for the northwest? I think of Whitney and his hospitality when my attention is called to the No. 20, and that is often. I think of A. G. Tuttle and his life work at present when I hear the name Russian; of J. C. Plumb when I hear soils for fruit growing called into question; of Freeborn and Hatch when I see or hear of McMahan; of friend Peffer and his resurrection when my attention is called to the Pewaukee, or the subject of hybridizing is mentioned; of friend Kellogg when I hear new strawberries, pears and plums discussed; of Charley Hirschinger when I read of large fruit exhibits; of Uncle Reed and Greenman when I read of grapes; of J. A. Wood and Pilgrim when I see or hear of large grain exhibits; of friend Palmer and his good butter when I see or read of a Jersey cow; of friend Stickney when I read of cranberries or horticulture in a general way. I think of the late Elder Alcott when I see a large Utter apple; I think of the honesty, perseverance and energy of Uncle Wilcox when I hear men say they have

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given up apple-growing in the north; of Sias of Rochester, Phœnix of Delavan, and Springer and Bennett of Waupaca Co., when I hear of new seedlings; of I. N. Stone when blackberries are talked of. But I must close, as I could continue my musings in this way almost indefinitely. I think horticulture is advancing in the Ninth district of Wisconsin, and there is quite an interest manifested there. I attended one day, and showed Duchess, Wealthy, No. 20, and some of my green winter seedlings last fall at the Beadle county fair at Huron, Dakota. My apples and one exhibit from Rochester, Minn., were all the fruit they had. I formed the acquaintance of several horticulturists and found quite an inquiry among the farmers for trees that would bear fruit in this climate. Near the Missouri, and twenty miles back in the country, grapes and wild plums grow in abundance, which is encouraging. I have received an invitation to read an essay at the Territorial horticultural convention at Huron on the 5th of February, so I may be in convention with horticulturists while you are assembled.

Wishing you a pleasant and prosperous meeting, I remain yours,

A. J. PHILIPS.

WISCONSIN HORTICULTURE.

By C. G. PATTEN, Charles City, Iowa.*

Having been a resident of Wisconsin from 1848 to 1862; first of Walworth county, and for nine years of Dane county, and a frequent visitor in your state, I may be permitted to suggest a few thoughts for the encouragement of Wisconsin fruit growers. But first, let me say that almost my first lessons in horticulture were from the old *Wisconsin Farmer*, and therefore I feel the more my near relation to the fruit growers of that state.

Draw a line from La Crosse to Baraboo, and thence northeasterly through Lake Winnebago to Lake Michigan; and all that portion south of this line, will compare favor-

*In *Western Farmer.*

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ably or more than average in natural advantages for fruit culture with the state of Iowa. These advantages are: first, the great body of water along the eastern and northern border of the state; second, the wide extent of forest reaching through all the central and northern portions, and the lake atmosphere reaching from thirty to sixty miles inland, while at Madison and Baraboo you can grow many varieties more successfully than can we in the northern half of Iowa; such varieties as Fameuse, Tallman Sweet and Seek-no-further doing fairly well there, but not so in this state.

That portion of your state has great forests at the north and west, while we have the great prairies for a thousand miles to the north and west. Thirdly, you have a greater variation of soil, with excellent natural drainage, while we have usually a heavy clay, and generally a more level surface. You have elevations for the large fruits and shelter for the small fruits. At Baraboo we saw maples in the valley, with twelve feet of dead tops, while in Mr. Tuttle's grounds, on the hill adjacent, we saw pear trees of twenty-five years' growth, and Fameuse apple trees of great size and in apparent health. This shows the value of comparative elevation for fruit growing. You have also the additional advantage of long experience in selection of varieties, and of obtaining new ones from the numerous seedlings which everywhere abound in the older sections of your state.

I would here urge your horticulturists to seek in every corner of the state for new and worthy seedlings, and to plant the seeds of good and hardy fruits to the same end. The Russian apples will be of more value in your state than in Iowa, especially in your northeastern section where it is more uniformly cooler. There they will blight less than with us.

Selection from old lists is good, but we have about exhausted them. Our main reliance must be upon native seedlings and their adaptation to a given location. The Pewaukee is all right in the lake regions where it originated, but a failure here.

The Turner raspberry will do here, but begins to fail as we go west of the divide in western Iowa. None of the

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lauded sorts of Lower Canada and northern Vermont have proven as hardy here as the Fameuse, which is far from perfect. We need hardier plums, pears, cherries, raspberries and grapes.

Nature's method is to plant seeds.

THE CRANBERRY INTERESTS OF WISCONSIN.

By C. E. MORGAN, Madison.

There are undoubtedly many operators in the state who could contribute valuable articles on cranberry culture, but public information is so limited upon the subject, and yet so much needed, that I have with some reluctance ventured to submit the result of a few years' experience, and a good deal of investigation, with the conclusions forced upon me by them, and from a careful study of the very little literature accessible treating upon it.

This consists chiefly of the published reports of New Jersey, now "American Cranberry Growers' Association," mostly statistical; and of the Agricultural Department, at Washington, which are largely compilations from this society. Apart from these there seem to be no authoritative publications, except two or three very limited works published some years since, better adapted to eastern marshes than to our locality. As it legitimately belongs to horticulture, and there being no association in the state for its furtherance, we desire to lay the subject at your door, and ask your co-operation in some feasible means of bringing its claims to the notice of the public.

The cranberry, like the strawberry, is propagated from the vine, but, unlike the strawberry, it requires from three to five years to produce a bed from which any amount of fruit can be realized, and that with the most thorough cultivation; while in the manner in which most of the marshes are conducted, from ten to twenty years are required to realize the full benefit. There are so many departments of labor connected with it that we can only allude to, without dis-

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cussing them: and yet they are as important as the many items in strawberry production, which commands so much attention, although local in its usefulness; while the cranberry is also an article of commerce throughout the Union, and its production limited to localities especially favored by natural facilities.

The first efforts at cultivation are understood to have been made on the Massachusetts marshes about the year 1820; and some years of experiment were required to demonstrate its success, when others engaged in it. But not until about 1845 had success been fully assured by producing such beds of fruit as to awaken any general interest. This is recorded as the first boom in its favor. Cranberries were at that time selling in the Boston and New York markets as high as from 50 to 75 cents a bushel.

From 1860 to 1865, New Jersey caught the inspiration. Marshes were there established on scientific plans. The bogs were cleared from all superfluous vegetation and a bed of sand 4 to 6 inches deep spread over the surface and planted to vines. With nothing to obstruct their spread they rapidly multiplied, and in from 3 to 5 years large amounts of fruit were gathered and the vines continued their growth until solid mats were formed with enormous production.

What would have been the result at the present day can only be conjectured, but for a set-back received from a disease which destroyed whole fields of fruit when approaching maturity. This disease, termed "the rot," and unknown in Wisconsin, has baffled the skill of all attempts to overcome it. Science, time and labor have been unsparingly devoted with great expense, to reach and remedy it by the application of chemicals. Lime, sulphur, potash, copperas and various phosphates were lavishly used and the wisdom of experts was enlisted, without finding any sure specific.

It yet baffles the investigators, and, from time to time, in different localities, continues its ravages. "Wholesale dying out of plantations of vines from disease are reported as of frequent occurrence in New England and New Jersey. Dead from root to branch, which the oldest growers are unable to account for." Their most rational conclusion

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seems to be, that the disease rises from the fermentation and decomposition of the bog, and, we believe, the absence of some virtues of our Wisconsin marshes, which exempt us from it. We cannot resist the conclusion that these virtues consist in the quality of our surface water, fully tinctured with the resinous properties of the pine and tamarack, and strong in the solution of iron.

The fact is that our central territory is underlaid with an extensive sand rock, porous in the extreme, but exempt from any internal channels through it, thus forcing all surface water through the extended bed of sand above it. The depressions upon this bed, receiving the vegetable washings of ages, constitute the marshes of bog and peat upon which the native cranberry luxuriates, being found scattered throughout this whole region.

In consequence of the losses sustained by this disease, year after year, old marshes are abandoned and new ones laid out and planted; the gross profits realized warrant the continuance of this. Some eastern operators, after a recent inspection of our advantages, have remarked, that with the competition we are capable of, their marshes must eventually give out, and they will have to look in this direction for their supplies. From our cheap lands and their superior natural advantages, with capital and labor wisely applied, there is little doubt that the fruit can be produced for much less and possibly for one half its cost to eastern growers. What is said of the New Jersey marshes applies in part to New England and Long Island. Other items of interest, such as insect depredations, frosts and water control, as compared with ours, are important, but time will only permit us to mention them.

We find from the reports of the New Jersey growers that their marshes cost from $200 to $1,000 per acre. A condensed statement reported by the Agricultural Department at Washington says their average cost exceeds $350 per acre.

When we contrast this with the outlay on ours in Wisconsin (excepting a very few which have been wisely and efficiently operated), ours are hardly worth summing up, probably $10 an acre would be an extravagant average esti-

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mate. A few statements which we have already published, taken from statistical reports, will illustrate the contrast between efficient labor there and the general practice here. Incidental mention is made of "forty acres producing 6,000 bushels, and eight acres yielding 1,400 bushels, and all destroyed by insects and 'the rot.'" Also mention is made of a plantation of about fifty acres with 13,500 bushels for its first crop, and a report of 1880 notices "ninety acres netting $25,000 above all expenses, being 80 per cent. of the entire cost of the plantation."

Some credulity may be required to entertain the truthfulness of these statements; but there are producers here who could demonstrate the facts in their own experience; they are, however, prudently reticent upon the subject. Yet what seem to be reliable reports speak of $52,000 as the value of a single crop on not a very extensive territory. Also, $16,000 paid out in a single year for additional water facilities by one company. We surrendered our doubts on a single test, from a favored spot, three feet wide by eighteen feet long, from which a bushel of fruit was gathered; a ratio of nearly 800 bushels to the acre. And this is not impossible on a larger scale, with conditions equally favorable.

The territory adapted to this crop in Wisconsin is immense, and for advantages, we believe, all things considered, unexcelled by any other state; and we need only the capital and its proper application to make it the most productive and profitable of any industry in the department of agriculture or horticulture existing here.

The country around these marshes is forbidding for settlement; slight elevations of sandy knolls, tamarack swamps and dwarf pines, with here and there a patch of better timber; the bogs frequently overgrown with high and low bushes, willow and feather-leaf and sage brush, showing its power for prolific growth in such vegetation as nature has planted there.

In nearly all this territory, on depressed portions, the cranberry vine is indigenous, waiting for the hand of man to remove the obstruction and permit it to propagate and yield up its wealth. Why we are so behind in the business,

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is a question naturally arising, and which it is my purpose at this time to notice. First, our advantages are so little known that but a very few of our marshes have been cultivated with any degree of interest; and most of those on the progressive plan; working little by little from year to year as time and means permit, until a profit can be realized to aid in further expenditure.

A few parties more appreciative, have concentrated their labors upon small pieces of territory, and by thorough working, have made their little patches attractive as a nucleus for extensive operations, which have proved mines of wealth to the orignators. The Sacket in Berlin, and the Baar marsh, near the Wisconsin Valley Railroad are notable instances.

The country is forbidding for residence to those who desire more congenial locations; and the settlers are made up of pioneers and lumbermen, with little means and time to devote to the culture; yet there is no one who has a residence here who is so poor but he owns a cranberry marsh of forty acres or more, which can be bought with a month's labor.

Thousands and thousands of acres are found among our state swamp and drainage lands begging for investment at from fifty cents to a dollar an acre; and also in railroad lands, contiguous to outlets, at mere nominal value compared with prices for agricultural lands proper.

Fully three-fourths of these residents have no means to improve their marshes, and the little they do on them is with the hope that nature will supplement it with a blessing.

Thus far the largest crop produced in the United States is reported in 1880. Total 492,000 bushels, New England 247,000, New Jersey 128,000, Western (mostly Wisconsin) 113,000. There are great variations in different years, and proportionately, Wisconsin has shown much better figures since. Michigan is also in the field, but her fruit is not in good repute among dealers.

It is clearly evident that could our advantages be appreciated, capital and labor attracted, and the work be prose-

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cuted so as to develop them, this (in the language of a tourist) "miserable, God-forsaken district of bog and foul vegetation" can be transformed into enviable gardens of wealth and beauty.

In conversation with an intelligent gentleman, whose interest and experience establish his authority, we remarked that there were bodies of marsh here that could not be bought for $500 per acre. "$500," he replied, "$1,000 would not measure the best of them." And there is abundance of wild country just as good to be had for fifty cents an acre, and the money handed back to the towns to be expended for their improvement.

The country is not unhealthful, but, on the contrary, conducive to health. Invalids, suffering from disorders such as dyspepsia, indigestion, inertia, etc., find an antidote in the water and air, inciting a healthy appetite, and they need not incur the expense of a trip to Florida to produce action required to contend with insect pests; the mosquitoes and deerflies in this region are ever ready to dispute the right of pre-emption with them.

Why interest cannot be awakened among growers for a state association for mutual benefit is answered by the fact that most of the operators already know more than they are able to practice; their greatest want is means to execute; while the few liberal workers, with longer purses, after patiently waiting for the results now being realized, do not feel disposed to publish all they have acquired, but invite others who would compete with them, to invest *their* means, to labor and experiment as they have done, and wait for the results from the use of *their own* wits and work.

This society could aid in awakening public attention by setting apart a time for the consideration of questions arising, and inviting discussion from any who could contribute, giving facts and the result of experience. Facts are what are needed to establish public faith.

This effort should be supplemented by some state action which would give an impetus to the enterprise, and stimulate our people to a realization of the wealth of our marshes, little dreamed of at the present day. The state of Wiscon-

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sin is not usually found lagging in profitable enterprises, and not until recently have the labors of the past given such assurances of success as are now being realized by the full maturity of some of our cranberry plantations.

The abundance of these lands proves a check to speculations which would otherwise spur the industry; nor can parties enter into the business with expectations of immediate dividends from their investments. They must be worked by interested and intelligent heads; and it is to be regretted, that there are no written authorities to aid the cultivator. Much labor and expenditure is in consequence misapplied, and operators are compelled to rely on their own sagacity in adopting the most feasible, from the many conflicting methods in practice.

The questions demanding investigation are frosts, insects, control of water, construction of dams, ditches and reservoirs, getting rid of brush and moss, planting, harvesting and curing fruit, etc., for which we find no authority except some few suggestions from time to time in the *Western Farmer*, called out by the investigations of the writer. An able eastern writer says, "There is probably no branch of industry as large as the cranberry interest which has received so little thought from intelligent men."

Our correspondents and others have suggested that a stimulant to the enterprise may result in over-production and unremunerative prices. This, in the face of the past, seems idiotic. There are citizens of Madison who remember when cranberries were hawked about our streets for 50 cents a bushel; and although our production has doubled within the past ten years, the large crop of 1883 sold to average over $8 a barrel, while January, 1885, saw the short crop of '84 held at $15 to $20 in the Chicago market.

With thorough tillage and improved means of gathering, they can be produced at a cost that will make them welcome at the tables of the most humble where they are now rare visitors. Our market is the civilized world; our territory sufficient to supply it. Europe has nothing to compare with us.

A little study has shown us that much can be done to

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counteract frosts through the signal corps at Washington and minute guns echoing the warnings over our marshes. Insect depredations find an antagonist in our kerosene torches and pan, which give us surprising results and opportunities to define their characters; and much light has been shed by the industry of the few who desire to investigate, and yet we are but in the alphabet of knowledge on the many questions arising.

As an illustration of the want of knowledge among operators, I will mention a single instance (they are many and varied). Word came to us that a party who, at great expense, had cleared off a tamarack swamp where nature had planted the vines, after replanting and waiting in vain for them to spread, found that he "had ruined his marsh," and got rid of it as worthless. The sequel proved that he had drowned out the vines, which needed but moisture, with sun and air, instead of a water-bed, for their propagation.

The most feasible way to reach our present wants, would be for the state to appoint a commission to inspect our territory, defining such localities as present most favorable advantages; to visit the best reputed marshes at the east, and also the most successful in our own state, and by comparing methods of operation, recommend those most worthy of adoption, in a full and elaborate report. Such a document, well authenticated, would attract capital and settlement, resulting in the sale of lands, and improvements in the territory; and would be a valuable acquisition to the industry. It would form a reference book for those engaged in the business, long needed; and, we believe, would initiate work of scientific investigation with a practical application that would eventually make Wisconsin the banner state for the production. The state would also be largely the gainer by the enhanced value of property for taxation; and the counties where these lands are located would at once recognize the benefits of the acquisition.

Our most valuable marshes are now under the control of Chicago operators; and if Wisconsin continues to sleep until the best interests shall be absorbed by foreign capital, as are our lumber interests in the north — *so be it.* A timely

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warning, demanding thorough investigation, is certainly worth heeding.

THE STRAWBERRY BED.

By MRS. ALEXANDER KERR, Madison.

I have chosen a practical subject and I propose to treat it in a practical way. A friend of mine, a farmer's wife, and a person of excellent common sense, has been giving me some suggestions which I want to repeat and to act upon. She came in with butter and eggs for me the other day, and as she sat by the fire to warm herself—she was bitterly cold—our conversation turned to the common topics of the day. I have learned a great deal, first and last, from her, and it is my way to let her talk on uninterruptedly. At length, she began "I was readin' over the programme of the Farmer's Convention last night, and I see that you are going to tell how to raise strawberries; I don't s'pose now you ever raised a quart of strawberries in your life. You don't look as ef you had; that is, I mean you never set out the plants with your own hands, and took the hull care of 'em yourself. That's what I've always been a tellin' *him*; them that's had the experience and knows just how the thing is done can't write it out and do it up in 'style' to read before the convention. As *he* said to me when he come home from the agricultural meetin' last year. Says he: 'Bless you; you know ten times as much about the real, practical way of doing things as these city ladies that read their compositions off so glib; but there's no use talking; you couldn't get up there before a room full of folks, and tell your experience to save your life; and I do' know as I should want you to, neither. I like the old-fashioned way of having the women folks stay to hum, so as to keep an eye on the place. 'Now,' says he, 'we farmers go up to Madison, and we have our say, and our talk is took right down and printed, and mighty interest-

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ing readin' it makes, accordin' to my notion. The fact is, we learn more about practical farmin' from them plain speeches, without any fuss or flurry, than we do from the high-falutin' lectures or whatever you call them, of the professors and such.'"

"Well, what I was a goin' to say was that I was thinkin' I might give you a little of my experience so that you could have something sensible to say, and not have your essay all made up of things you had learned out of books, witn a little poetry tacked on to make it sound nice."

"I shall be very glad to have your help," was my reply. "I suppose I may ask you questions on the points I wish to write upon?" "Ask all the questions you want to, but when I get to talking, it's hard to stop me, you know that well enough. So you may let me go my own gait, and get in questions edgeways if you can.

"Now, if you're goin' to have a strawberry bed, you want to look out a good place for it. Don't be put off with any patch of ground where nothin' else will grow. Pick out a sunny spot, sheltered a little. That reminds me, I believe I'll tell you about the first strawberry bed I ever planted. When my boys were just old enough to go to school — we were livin' in Rock county — we moved into town for a couple of years and we rented a house and a little bit of a garden of the nicest gentleman that ever was; him and his wife lived pretty much by themselves and they had the greatest lot of strawberries, raspberries and grapes you ever see. I remember we moved in about the first of July, couldn't get possession of the house till then, and most every day all that summer, him or his wife would bring in a quart or two of berries, or a few bunches of grapes or something of the sort. They would leave them in the kitchen on the sly, when I was in the front part of the house; for they didn't seem to want us to thank them too much. They had so much fruit they couldn't use half of it, they didn't care to sell it, they was too well off to take that trouble, so they gave it away.

"There was one queer thing about it. Mr. Winchester—that was his name, would, never say 'come over and help your-

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selves, I've got more fruit than I know what to do with;' but he would always pick the berries himself. The neighbors did say, that he had a tenant there one year, a minister he was too, and he thought he would be extra kind to him, so he told his folks they was welcome to come over and get berries and grapes, and if you'll believe it, they used to take the choicest of everything so that he couldn't count on nothing for himself. Well, his way suited me; course you know boys will be boys, and if they got to going over into that garden every time they felt like it, there would have been trouble. So the children never picked so much as a cherry, tho' there was one tree that hung its branches almost into the window where they used to sit, and the kind neighbors, they noticed that just as they noticed everything, and they used to pick the largest and the ripest cherries and lay them the whole length of the window sill when the boys were out of sight.

"We got to be famous good friends right away, and though I say it as shouldn't, they seemed to like us all first rate, and one day along in August, Mr. Winchester, says he to me, 'Wouldn't you like to have a strawberry bed of your own? because I have plenty of nice plants that you can have just as well as not, and there's a little spot of ground in that corner yonder, with a high picket fence on the north and on the west that makes it about the warmest place in the garden; it lays just right, and the soil is good and free from weeds.' I could see that myself, so I said, 'I should be proper glad to have a strawberry bed; but its no use talking, for *he* won't be contented to rent the farm only till the two years are up, and if I should go to all the trouble of getting the strawberry bed started next spring, we couldn't get no good out of it, it wouldn't bear none the first season.' 'I mean for you to set out your strawberry plants right away; that is, the first rainy day, when they will be likely to do well.' 'What!' says I. 'Plant strawberries in August? I never heard of such a thing before.'

"'Well, you just try it, for an experiment.' So I had the ground all ready, and along toward the end of the month, after a dry spell, we had a warm rain, and one afternoon

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Mr. Winchester brought me over a basket of strawberry plants. He told me the kinds, but I don't know as I exactly remember the names. There was the Jucunda, and some I think he called Triumph de Gand or de Grand. 'Now,' says he, 'don't you set out none but the strongest plants. Its a waste of time to put out a plant with no root scarcely, and I've brought enough, so that you can take your pick.'

"Well, out of that basket full I only set out seventy plants. But every one was a beauty. Seven rows and ten in a row. I put 'em a foot apart. I could not afford to be wasteful of ground in such a little bit of a garden. You never see anything grow as them plants did. Of course I give some time to 'em, but there warn't no hard work about it. If any weeds started, I just went over the ground with a rake after dinner, while the sun was shining pretty hot — did not take me ten minutes — and them weeds were killed almost before they had begun to grow. And then, after supper, I'd take my scissors and cut off the runners, so as to keep the plants nice and shapely. Well, when November came, I had a little clean straw put over the bed, and the winter was mild, so the plants came out all right in the spring. It was wonderful how they grew, and how full they blossomed, and how the fruit set. Of course Mr. Winchester, he took considerable interest in that strawberry bed, and one day, early in June, he says to my husband, 'see here! your wife's strawberry bed beats any of mine. I never see anything handsomer. I've always been proud to show my company round my garden, but, I declare, I never had anything to equal this;' and we noticed after that how he took pains to show it off to his visitors. Then it came into my mind that it would be a good plan for me to keep count how many berries I got from those seventy plants, so I put it down in the almanac. So many quarts every day, as long as they were plenty; along at the last when they were scattering I let the boys eat what was left right off the vines, and by actual measurement I picked from those plants, set out considerable less than a year, forty quarts of the finest, sweetest berries I ever had. After we moved back to the farm I always managed to have plenty of strawberries, and then I got my boys to plant raspberries

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and grapes, and to set out fruit trees, all because I had such good luck with my first strawberry bed."

"So it's no trouble to raise strawberries?" I said, as my friend stopped and moved her rocking-chair a little further from the fire.

"Ah, that's only one side of the business," said she; "not that I've ever had any cause to complain myself, tho' sometimes there's a bad season — too wet or too dry, or something, so as I don't get a large crop; but if you want to know the other side, you just ought to hear my Mary tell about her strawberry bed. You know Mary — at least you used to know her — she that married Lawyer Dow, John Dow. She was tellin' me about it this summer when she and the children was visitin' me. You didn't see her baby, did you? The cutest little thing, and pretty as a pink. Well she was a tellin' me about their tryin' to raise strawberries, and I laughed, and I laughed, and I thought I should a died a laughin', to hear her go on. I can't begin to tell it as she did. I wish you could see her.'

"John Dow's pretty forehanded—owns a nice place and is a good provider; but you know yourself how 'tis with these men; every once in a while the best of 'em 'ill get the blues and think the wife is extravagant, and the whole family on the straight road to the poor-house.

"Three or four years ago or so, I forget just how long it was, fruit was scarce and high, they had been payin' twenty cents a box for strawberries all the season, when one afternoon just before tea-time, John and Mary was both sittin' on the front porch when their market man drove up with fresh strawberries and left two boxes as usual. Mary didn't happen to have any change handy, and as John is very particular about having every thing paid for, cash-down, she asked him for fifty cents to pay for the strawberries. Why, Mary said it just took his breath away; he had no idea that strawberries could cost as much as that, tho' between you and me John Dow don't mind paying 25 cents apiece for cigars on occasion, when he has a friend with him. Yes, it almost took his breath away — and all the time they was

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eating their supper, he was talking about those high-priced strawberries.

"'Here,' says he, 'We've got land enough to raise berries to feed the town, and we've been victimized and extortionized, and I won't stand it. Don't you pay another cent for strawberries this summer, Mary.'

"Of course, he forgot all about it in a week, but by that time the season was over, and there wasn't any strawberries to be had for love or money. But that idee of raisin' his own fruit stuck by him all winter, and whenever he had a little spare time he would study the advertisements and write somewhere for a fruit catalogue, and by spring he had a stack of 'em from New York and Pennsylvania, and Wisconsin, Kentucky and Illinois and Canada, even. Then he handed them over to Mary.

"'You're the horticulturist of the family,' says he, 'pick out a list of twenty fruit trees and I'll order them, and see to getting a strawberry bed started. Have Murphy spade up the ground and when you have the plants, I'll set them out.'

"Well, Mary told me she rather left it to Murphy to say where the strawberry bed should be, and it seems they hit on a cold, damp place on the north side of a board fence. Mary didn't think anything about having the soil improved, and all Murphy thought about was getting his day's work done.

"But the bed was made, and they waited some time for the plants. They decided on "Charles Downing" and "Green's Prolific," and sent off for 100 plants of each kind, at 75 cts. a hundred. Mary could just as well written home for plants, but John wanted to do things in a business-like way, and not be beholden to nobody; perhaps, too, they thought these two kinds were better than any I had.

"Them plants came one afternoon in May, just after John had gone to his office, the very day that John had put on his new spring suit for the first time. Pretty soon Mary she heard it a thunderin' and see that there was goin' to be a shower. She thought 'twould be a pity not to get the plants set out while the weather was just right, and she got a boy

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to help her, paid him fifty cents, and by hard work they got them out, but not in time to escape a pretty good wetting.

"As soon as Mary got back into the house she said she hurried to dress herself up nice again, and about half past five she was sittin' by the window tired to death but pretending to be busy with her sewing when John came up the walk. He had a new Harper's Magazine in his hand, and was more cheerful than common when he came in. The sun was shinin' and everything looked pleasant, and after he had hung up his hat, and was a brushin' his hair before the glass, he says, 'Mary, here's a new story begun by your favorite author Miss Woolson. You read the first chapter out loud, won't you?'

"'But the strawberry plants have come; don't you want to set them out?' He didn't look quite so cheerful for the next minute or two; then he said, looking down at his light-colored, tight-fittin' trowsers, 'I'm hardly dressed for it; they'll have to wait till to-morrow morning.'

"So Mary read aloud till the bell rang, and after tea she showed him the strawberry bed; he was pleased enough, praised her work and asked her how she got the rows so straight, and admired her flower-beds close by and ended with repeating that old proverb, 'Well begun is half done.' But you must remember that there was the whole season though that those plants had to be taken care of, if they was a goin' to amount to anything. Mary said that when she considered how she had paid out three dollars already for the plants and for work on that strawberry bed, she thought that she ought not to hire any more help, and she did as much work as she could herself. John was always too busy — he couldn't take the time — besides, he had all the exercise he needed going back and forth from the house to his office. The consequence was that two or three times along in June and July, Mary came to the dinner table with her face as red as a beet, and when John asked what she had been doing — if the cook was gone or what was the matter — she had to own that she had been working in that strawberry bed. At last he couldn't stand it any longer. Mary got the headache, and John says it's like purgatory

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when the house smells of camphire, and Mary has to give up for a whole day. So he gave express orders that Murphy should keep the strawberry bed in order. He gave time enough to it, goodness knows, for his bill was $4.20; but the plants didn't seem to thrive. They were small and stunted, and John concluded that the soil wasn't rich enough, so one day in the fall, when Mary was away for a week and time hung heavy on his hands, he thought he would put some wood ashes about the roots—somebody had told him it would be a good thing—so he put on some old cast-off clothes, and old boots, and a seedy hat—his own mother wouldn't have known him—and he was on his way to the strawberry bed with a pailful of ashes in each hand when a distinguished-looking stranger called out to him, 'Is this where Lawyer Dow lives?' 'Yes.' 'I am not acquainted with the gentleman, but a friend of his told me that he thought he would be willing to show me the new furnace he has lately put in. But I see the house is shut up, Mr. Dow and his family are absent from the city, I suppose?'

"'I guess I can show you the furnace—I have charge of things here,' says John. For that furnace was something John had given a good deal of thought to, and the new way of ventilating was an invention of his own; he wanted the public to know about it. So, as he told Mary, he went around and explained everything, looking like a professor of dust and ashes, and never let on as to who he was. The next week the same gentleman came into John's office, and told him about his having been to his house in his absence, 'and,' says he, 'I found a very intelligent man in charge, but I want to ask you a few questions,' and he never mistrusted that the intelligent man was Lawyer Dow himself. And Mary says that was the last time John did any work in the strawberry bed.

"The next spring everything was left to Murphy, but all the neighbors wanted him, too, and Mary's garden didn't get as much care as usual and the weeds got a start among the strawberries; there were blossoms,—not very many, for the plants were shaded too much—and the season was late

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and cold. But about the last week in June, Mary had a few strawberries from her own garden. They had a nice flavor and John couldn't praise them enough. They had been having them every day for a week, when, one morning, as John sat down to breakfast, he says, 'the neighbor's chickens were over here, bright and early this morning, helping themselves to your berries and yesterday noon I saw three boys run out of the yard, just as I came up from down town. I think they had been paying your strawberry bed a visit. You had better organize yourself into a police force, if you expect to keep any fruit.' 'I am afraid it's too late,' says Mary, 'the strawberries are almost all gone.' 'Gone! we haven't had a bushel, have we? How many quarts have you canned?" 'Not any, and we have only picked fifteen quarts.'

"'Is that all?' And how much did the plants cost?

"'$1.50.'

"'And what did you pay for spading up the ground?'

"'$1.00, and paid a boy 50 cts. for setting out the plants.'

"'And what did Murphy charge for weeding the bed last season?'

"'$4.20.'

"'And I paid $1.00 for mulching in the fall. Let me see, that makes $3.00, $7.20, $8.20.'

'"Paid out any money for that strawberry bed this spring?"

"'When Murphy put the place in order he worked there about half a day. You might call it 80 cents; that makes an even nine dollars.'

"'Nine dollars for fifteen quarts of strawberries!'

"'That's 60 cents a quart.'

"Mary said John didn't make no answer. He got up from the table and walked out to that strawberry bed. She went along, too; it looked weedy and ragged; the plants all trampled down — the worst looking spot on the place.

"'Now, Mary,' says he, 'you tell Murphy the first time he comes here to work, to spade up these strawberries and sow a pound of lawn grass seed on this spot of ground.' And Mary says since that they've bought all their strawberries and there's been no grumbling about the price."

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"That's rather discouraging," said I.

"Why, be you thinkin' of having a strawberry bed of your own? Cause if you are, I'll tell you a secret worth knowing.

"You can't grow berries on Fourth Lake ridge, without you warm up that stiff, clayey soil, so you get a load of black sand from over by Third Lake, and besides make the ground as rich as you can, and see if you don't succeed pretty well."

My friend would have talked an hour longer, but her husband drove up to the door and called out to her that his horses wouldn't stand a minute, so all I could do was to thank her and hurry her off. She has promised to give me strawberry plants next August or September.

These two experiences, widely differing — each one, perhaps, an extreme case, teach us, it seems to me, two lessons.

1st. That the oft-repeated saying of the advocates of the so-called "new education," "we learn to do by doing" is illustrated in no branch of industrial pursuits more forcibly than in horticulture.

2d. We are emphatically reminded of the truth of the old adage: "If you would have a thing well done do it yourself. You must not leave it to others."

BEST SMALL FRUITS FOR WISCONSIN.

By I. N. STONE, Fort Atkinson.

There is certainly an increasing desire among the farmers and those who own even a few rods of land in Wisconsin, to grow a home supply of small fruits. There are those, too, growing small fruits for market who are striving to place in the market fruit that will not only be attractive in appearance, but fruit which will be satisfactory to the consumer in every respect. The small-fruit grower often finds himself at sea when he undertakes to select plants from the many varieties now in cultivation.

We should select those that are hardy enough to stand

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our climate and, at the same time, will produce at least a fair crop of fruit of good quality.

We already have tested varieties of different kinds of small fruits which combine these three very important qualities. It is true the small-fruit crop is sometimes lessened on account of drouth, insects or frost, but by careful comparison I conclude not oftener than other crops grown in our state. Still there are many who are well situated to grow a home supply of small fruits that will not make one effort, discouraged perhaps by the failure of some one who has been experimenting with some *worthless* variety.

I have tested over fifty of the leading varieties of strawberries which have been before the public during the last fifteen years, and I find no real value in nine-tenths of them when I compare them with the more reliable varieties we have among them.

We still find the Wilson being more extensively grown for market than any other variety, and I have no hesitancy in saying that if I could have only *one* variety to grow for market, I would take the Wilson, as it is self-fertilizing, productive, of good color and fair quality, good for near or distant market, and succeeds on any soil. It will fruit well on very rich soil and still retain its good qualities for shipping and flavor; while the Crescent and some other varieties if grown on very rich soil lose in firmness, color and flavor. The Crescent excels the Wilson in some respects, being earlier and even more productive, with a stronger plant, and less liable to rust and injury by frost; but it is not firm enough to ship over one hundred miles, and requires a staminate variety to be planted by its side. It is a good companion for the Wilson, and by having these *two* varieties with *even fair* cultivation, a good crop may be expected. By adding the Longfellow and Manchester a good succession will be obtained covering the entire strawberry season. The Longfellow is a late staminate variety, a strong growing fruit, large and of excellent quality. The Manchester is a late pistillate variety, producing fruit of good quality, though rather soft for shipping; but it is growing in favor for a home market.

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If more varieties than the Wilson, Crescent, Longfellow and Manchester are desired, I would recommend Piper's Seedling, Old Iron Clad, Atlantic and Mrs. Garfield, as being among the most promising of the newer varieties.

We have a new list of black raspberries, which have come into general cultivation within five years, and it is well we have them, as the old varieties have become diseased and are no longer to be relied upon. The Souhegan, Tyler and Gregg will give a succession of black raspberries during the entire black raspberry season; each variety is hardy, productive, and bears fruit of good quality. There are no better varieties tested, for a succession of this desirable fruit. Fruit growers who are growing extensively for market, will find it an object to add the Ohio to the above list, as its season is medium and it will help to keep the supply of fruit full between the earlier and later varieties.

The raspberry season would not be complete without a good supply of reds. The Turner and Cuthbert, for home use and near market, and the Brandywine for distant shipping, will give an assortment which will cover the entire red raspberry season; all are of good quality and perfectly hardy.

Those who prefer a tart red raspberry will find the Shaffer's Colossal much better than the Philadelphia in every respect. It does not send up suckers, but increases like the black raspberry—from the tips. It is very productive, hardy, and needs plenty of room; should not be planted closer than 3½ by 7 feet. It is not firm enough for shipping over 50 miles. The Marlboro seems to be the most promising of the new red varieties.

Blackberries are being quite extensively grown in Wisconsin now; Stone's Hardy and Snyder without winter protection, and the Ancient Briton with winter protection, are the varieties in general cultivation here. They are undoubtedly the best in cultivation for this latitude.

The following varieties of grapes are among the best that are succeeding here: Worden, Concord and Moore's Early, Lady, Brighton and Agawam. The Prentiss, Pocklington

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and Niagara are promising new varieties, which are being tested here. The impression seems to prevail that currants cannot be grown successfully in Wisconsin, on account of the currant worm. We cannot afford to be deprived of this valuable fruit when this insect can be so easily destroyed. The Red Dutch for early and Victoria for late, are the reliable varieties in general cultivation here.

The Fay currant is the most valuable red variety in cultivation. It seems to do well wherever planted. It has made slow progress in its introduction into this state because of the high price of the plants; but on account of the size and quality of the fruit and its great productiveness, it will come into general cultivation here as soon as the price of the plants is within the reach of the masses.

There are but few gooseberries grown for market in our state; still we find them quite extensively grown for home use. The Downing and Smith's Improved are considered the best varieties for general cultivation.

Fruit growers are often asked the question, Which is the best cherry for Wisconsin? Well directed efforts have been made to grow the leading varieties which are a success in other states, but as yet they have proved very uncertain here. We have an unnamed variety (as far as I know) being grown more extensively in the vicinity of Lake Mills than elsewhere, which is the most reliable variety we have. I do not know its early history, but during the last ten years, in which I have observed it, it has not failed to produce a good crop, except when a late spring frost has killed the fruit. The trees grow from the sprouts and produce the same kind of fruit as the parent tree; it is as hardy as an oak, a prolific bearer; fruit of medium size, bright red and of good quality; season medium. I do not know that any nurseryman is propagating this variety for sale; but I am confident it is the best cherry, all things considered, we have for this state.

The varieties mentioned in this paper are among the best of the tested ones in cultivation. Some do better in some localities and on certain soils than others, but this can only be found out by trial.

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GRAPE GROWING FOR FARMERS.

By C. A. HATCH, Ithaca.

The fruit of the vine is something that few of the human family do not admire. The vine has been, from the time of earliest history, the emblem of home comfort, and the vine and fig tree synonymous with rural independence and enjoyment. Yet we presume not one farmer in twenty of this country of ours has grapes enough on his farm for the use of his own family. And why is it? Is there any lack of soil, or conditions necessary to the success of the vine? It cannot be for lack of the right kind of soil, for grapes will flourish on almost any kind of land, from the poorest clay or sand to richest mould. It cannot be for lack of the right slope of the land, for our many hills and narrow valleys give any desired slope, to be found on almost every farm. Varieties, we have in plenty, and those who have them to sell are anxious to speak well of their virtures. Can it be that our farmers are more willing to "lend ear" to something that has dollars more visible. Cannot they get their ideas off of hogs, cows and sheep long enough to give a little attention to something that will promote comfort, health and prosperity without being sold for the cash? Something that will lighten the cares of the wife, and make home attractive to the younger members of the family, make them healthier, happier and brighter, to say nothing about the satisfaction of one's own self by disposing of a few clusters when coming in for nooning, weary and footsore?

Whether it be for any of the foregoing reasons that farmers do not plant vines, or whether it comes from negligence or an idea that too much skill in pruning and care is required, we shall take the charitable side of the question and say the last reason is the one, and try to make this a practical article. And right here let me say it is a false notion that any great amount of special skill is needed—not so much as to grow tobacco, hops or many other things; but grape growing does require certain things to be done at the right time;

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for example, the vine must be pruned in the fall, and *must* be covered in the winter, and must be tied up to stake or trellis in the spring. Some no doubt would ignore all three of these points and say you need not protect in winter, you can prune in the spring, and let them grow on the fence for stake and trellis. A man might grow grapes by not covering them winters; in fact the last season I saw a vine that was heavily loaded that had neither been pruned nor protected nor even tied to a trellis, but this was an exception, not the rule.

The first thing is to get your vines of course. Now when you are at this point one word as to the varieties. Every one knows the Concord, and it has been called "the grape for the million" so long and so often that it has become monotonous; and we think that if any horticultural society were to offer $50 reward for an essay on grapes in which the Concord was not called the grape for the million it would be safe; the money would be untouched; the essayist could not be found.

The Worden is a seedling of the Concord and has all of its desirable qualities and some of its own; we will say of it a little more than "It is the grape for the million"—it is the grape for the billion, if we are allowed that form of the superlative. The Janesville for earliness, hardiness and productiveness is hard to beat, and these two varieties—Worden and Janesville, are enough for a farmer's vineyard. If you want to try something more delicate in habit, also finer in quality, there are the Delaware and a long list of Rogers' hybrids, but I would say let the specialists grow them; it takes too much fussing for an ordinary farmer, with so much other work always calling for his time and attention. For my own part I never could appreciate them. Perhaps my taste is not cultivated, perhaps I am open to the charge of not being refined in taste, but I always prefer Worden or Concord to any other, for my own eating.

You will likely get two-year-old vines, and now is the time to train them in the way they should go. This brings us to the most important part, pruning; for you must prune your vine so as to start right, for that is half the battle. One vine or

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cane to each root is all you want to allow to grow the first season, and this should be cut back in the fall, after the leaves fall, to two buds, from which your next year's vine is to grow.

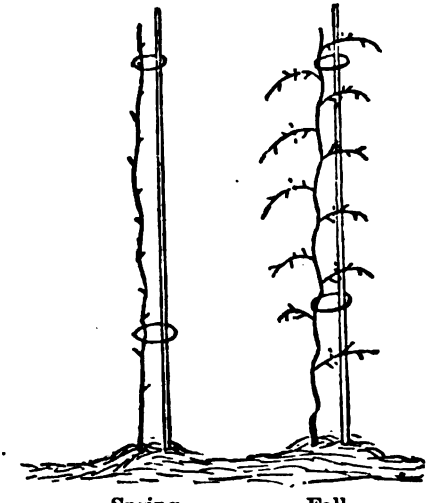

Fig. 1. Grape vine second year after planting.

The next fall cut the two canes back to four feet in length, and if you want to train in the simplest way possible, cut one off the Janesville (Concord or Worden will need the two), and tie them up to a stake; no stakes will be necessary the first year. Your vine is now in regular shape, and each year's work will only be a repetition of the former year's. You now have on the Janesville one vine four feet long, and on the other kinds two of the same length; these will in the fall each have branches or laterals, as they are called, on which the fruit, if any, will be borne. These laterals must be cut back to two buds each, every fall before burying for winter. And right here let me call your attention to a fact not generally recognized, that the vine on which fruit is grown is a bud in the spring, the vine as well as the fruit growing the same season. One hundred and fifty buds are considered the greatest number allowable on a vine, so do not think it destruction if you do cut away nineteen-twentieths of the vine in pruning.

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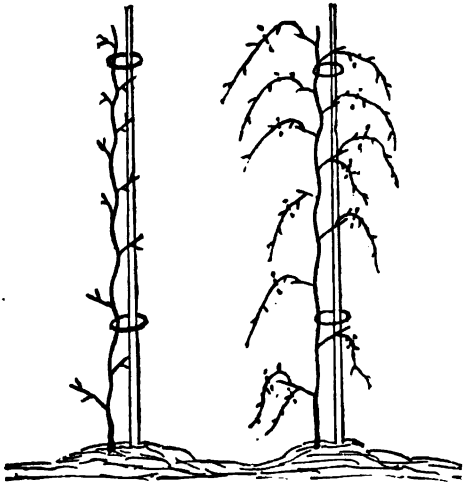
And now you have all that is necessary to raise grapes. As a covering I have used dirt only, put on four or five inches deep, and have had good success.



Spring. Fall.

Fig. 2. Grape vine, third and succeeding years after planting.

Some may say summer pruning is necessary, or that an expensive trellis is necessary. I have not found it so, and think summer pruning and trellises of any kind except what is really needed to support the vines, are worse than useless.

THE GROWING OF SEEDLING APPLES.

By PETER M. GIDEON, Excelsior, Minn.

Perhaps a few items on the propagation of new varieties of seedling apples would be of interest to many not familiar with the facts or principles governing the production of new varieties from seed; therefore, please indulge me in a short essay on the subject, though in doing it I repeat many items often told, yet new and of great interest to the great mass who desire a better collection of fruit, whether they intend to embark in the business or not.

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I began the culture of fruit about sixty years ago, by planting peach seed. Got a good stand and good growth the first year; then dug, reset and cultivated them myself, and had the pleasure of eating fruit from them before I was nine years old, and ever since it has been my chief calling and delight. But our efforts and trials in Minnesota began thirty years ago last spring by planting one bushel of apple seed, a peck of peach seed, and 500 apple, pear, plum and cherry trees, and for eleven years thereafter we planted each year enough apple seed to bring a thousand trees, and in that time made frequent additions to the orchard of old, named varieties — all southern or eastern grown trees and seeds. All were kept as long as they could be made to live in Minnesota, and to-day only two trees remain. One of those, the Wealthy, was grown from a cherry-crab seed, obtained of Albert Emerson, of Bangor, Me., of whom I obtained cions at the same time, from which I grew the Duchess, Blue Pearmain, and the Cherry-crab, all of which combined were the foundation of Minnesota horticulture, that to-day is the pride and hope of the northwest. But since these varieties came into bearing, we have planted only of our own growing of seed, with forty first-class varieties the result. Not large, but each first-class of its size, and none of the forty less in size than Transcendent or Hyslop, and every one better in quality than those, whilst several will equal, if not surpass every known popular variety, whether to eat from hand or for culinary purposes.

And now, having given the results thus far of those that have come into bearing, I will state the process by which those results were obtained. The process was, and is yet, the crossing of the common apple with those varieties that had enough Siberian Crab in the composition of the tree to make of it what we term an iron-clad, and we do this by close planting, that wind, and bees and other insects can the more readily and surely carry the pollen from bloom to bloom — from one variety to another — so as to fertilize the germ of the fruit. The seed so fertilized, we plant, and when the young trees are large enough to set in orchards, we select the best, and then wait to see what the fruit will

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be; but it is not every seed that will produce a good apple, for no two seeds will be fertilized just alike, hence no two trees just alike, even from seed of the same apple.

From the same lot of seed we grow apples from the size of a large green pea up to the largest size, and of every imaginable form, color and quality, and the varieties diverge as widely in form and habit of trees as in fruit. Thus far, of those selected and set in orchards, about one in each fifty has given a first-class apple, and for the reason that our seedlings are a mass of mongrels — mongrel crossed in the mongrel — each, perhaps, of a thousand grades, hence the uncertainty as to what we get; yet we have demonstrated that out of a great mass we are sure to get something good. The hardiness of the crab has to be retained in the tree, and size, without the astringency of the crab flavor, in the fruit, and to judge with any degree of accuracy as to what class of tree is most likely to combine the sought-for good qualities, requires no small amount of careful observation, through a long series of experimenting, and then we miss far oftener than hit. When we grew the first from our own growing of seed, we set all in the orchard, and later set in orchard about one-sixth, and yearly as new seedlings come into bearing, we develop in knowledge, and as we gain knowledge the per cent. set in orchards grows less. Thus far it has taken from 300 to 500 seedlings to give us one first-class apple, and that from seed taken from the best apples we had; but in the same orchard grew a vast amount of inferior apples, that to a greater or less extent adulterated others, hence, to some extent, the smallness of the gain.

But the conditions in the state orchard are quite different. There nothing but the very best is set, and from it we anticipate a larger percentage of good fruit, though mongrels will cut mighty freaks sometimes in reproduction, and, as yet, the oldest trees from the state orchard seed are only two years old; yet young as they are, many bid fair to give good fruit, and, in fact, our faith strengthens each year as new varieties come into bearing. But the way to determine whether I have adopted the best known mode by which to develop new varieties of good quality adapted to our climate

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is to note the results, and the result is more first-class apples in the last fifteen years than have resulted from all other modes put together.

The Siberian cross has given us hardiness of tree, and a combination of qualities not found in any other class of apples, whether to eat from hand or made into sauce — for either use we can match the world, and, therefore, I hold the Siberian crab to be a Godsend to the entire North.

The object of the state orchard is to grow from seed new varieties adapted to our climate, and especially long-keepers, and to that end we planted close together in rows, with every alternate tree a long-keeping variety, and the other alternates are our best iron clad seedlings — the one to give hardiness and the other long keeping. In the cross we expect to get some combining hardiness of tree and long keeping fruit of good quality, a treasure we have not yet got, and to get it we top-graft long keepers on hardy seedling stocks that get their growth early and stop their sap flow, thus compelling the later-growing more tender variety on top to harden up for winter, and thereby produce and give us the cross, which could not be done were the long-keeper on its own tender late-growing roots. And even on the best of stocks we find but few long-keepers that can be made to stand and give fruit, and none that are hardy enough to make a permanent tree; and only about twenty out of one hundred bid fair to some day yield fruit — as yet only a few samples have been had from any long-keeper. The cross is made in the bloom, the pollen of the ironclad being infused into the bloom of the long-keeper, and the seeds from the long-keeper thus impregnated are planted, and the young trees that prove hardy and of fair appearance are selected for fruiting.

We have, by careful and repeated plantings, demonstrated to a fact, that the seedling will ripen its fruit at or near the time the parent apple did from which the seeds were taken, no matter what crossed with, nor how closely it partakes of the male parent in the tree and quality of the fruit. In our many trials we have solved the problem what to do and how to do it, and now, with the state orchard set to our notion,

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we are fairly started on the road to sure success—to make Minnesota a great fruit-growing state.

The state orchard was set six years ago last spring with root and crown grafts—no material difference in their growth—and to each was set a stake to mark its location; and at this date we have had three crops of apples from it, and the seed of all was planted, the last crop being about seventy bushels of the very finest of apples. So taking the success of the past as a criterion of the future, we may reasonably expect not far in the future to number our first-class varieties by hundreds, and in succession the year round. And, in conclusion I will just add, that many seedlings on our own grounds bore this year (1884), for the first time, but as seedlings do not always prove true to their first crop, we neither name nor send out until after the second fruiting, therefore but few varieties can be had before next fall, at which time we hope to have a full supply of all trees of the best varieties.

THE PRACTICAL ASPECTS OF FUNGOID PLANT DISEASES.

By A. L. HATCH, Ithaca.

At one time we had in our nurseries fifty kinds of crab apples and hybrids. We expected and predicted splendid results from them on account of their extreme hardiness and early and profuse bearing, as well as their beauty, richness, and usefulness of fruit. Our brother nurserymen as well as ourselves were enthusiastic over these varieties and a wonderful number of new sorts were brought out and disseminated throughout the northwest. They have not, however, met the general expectation of success and it is meet and proper that we should learn the cause.

We often note the general failure of one or more kinds of common apples and quite as often learn of splendid success in some localities. Disaster and failure sometimes follow large plantings when a few isolated trees would seem to

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point unerringly to certain success and sure returns for larger quantities under the same conditions. The subjects of local climatology, of soils, of subsoils, and exposures for orchards have all been considered more or less in horticultural literature and still one universal influence has been scarcely noticed by popular writers on fruit topics. Indeed many of its practical features need investigation at the hand of scientists, who have apparatus, skill, and facilities not possessed by common fruit growers.

After several years of experience and observation we are satisfied that parasitic fungi in the form of mold, rust, scab and rot have injured fruit culture in Wisconsin more than severe cold has. They are the precursors of winter-killing, even of hardy varieties, by their weakening powers; and their direct attacks upon fruit in the form of scab and rot cause losses of vast amount.

Fungous growth is so radically distinct from that of ordinary vegetation that it stands as its opposite in nature. Such plants as we grow on the farm or in the garden, indeed all our useful plants, with a few exceptions, derive about all their structural growth from the air, and this growth is connected with the absorption of carbonic-acid gas by the leaves. Water and mineral matter and nitrogen only are derived from the soil. There can be no growth of these plants without leaves to absorb carbonic-acid gas from the air, that they may appropriate its carbon to form cells, starch, sugar, etc., that make up the plant structure or its fruit. Fungi make their growth by absorption of carbon through their roots — or rather what serves as roots in these plants. Whatever they grow upon, whether living or dead, is changed by their growth. The carbon of economic plants, whether in the form of fibre, gluclose, oil or other substance, is devoured by these greedy roots, while the outer portions give off into the air carbonic acid gas. Thus we see fungi are the antipodes of common plants, absorbing by rootlets instead of leaves, giving off carbonic acid into the air, and living upon the very life of plants.

One form of fungus, apple scab and leaf blight (*Fusicladium dendriticum*) has caused the general failure of our

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crab apples and hybrids leaving us only a few really good sorts of the many tried. In some localities Fameuse and Walbridge apples are utterly worthless on account of scabbing of the fruit, and on the leaves of some apples it has proven wonderfully destructive. We have a tree of Briar Sweet crab ten years planted that never bore a peck of apples although large enough to bear five bushels. Some summers it will have scarcely a hat-full of leaves on account of this fungus.

To secure immunity from this trouble our observation points to many possibilities. It is a fact found by microscopic study that leaves and fruit are more or less furnished with a protective coating or varnish-like covering. This is assumed to be either wax or silica. Whatever it may be it is probable that some soils furnish more of it than others and that some fertilizers may also. Orchards in virgin soils or in a rank growth of clover seem to grow the finest fruit and suffer less with this fungus. While isolated trees may succeed in bearing good crops, large plantings seem to develop this troublesome leaf blight. Perhaps when this fungus is fully understood we may find that its method of dissemination and growth are affected by the disposition of falling leaves, by the direction of the winds, etc. Again we shall doubtless find that we must modify our planting and seek thick-leaved kinds well furnished with protective coating for both leaf and fruit. While practical researches should be made by fruit growers and nurserymen we may be assured that it will receive more attention from scientists, notably, in our own state, from Professor Trelease, whose work in this line should receive hearty co-operation.

It is, at first view, unfortunate that science is so buried in technical terms. Its hard names and laborious phrases seem to withdraw it wholly from the realm of practical life. To many it may seem wonderfully intricate and hopelessly complex. Really, however, science is only nature, and nature herself is wonderfully complex. If we look into Professor Trelease's list of Wisconsin's parasitic fungi we shall find twenty-five kinds of *Peronospora* — that terrible fungus that rots our potatoes and spoils our grapes. The

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life history of this fearful scourge to vegetation is wonderful as romance, and in its results it is almost appalling. That its spores, like invisible dust, are borne upon the breezes, and fall like a shower upon congenial plants, there to work destruction and death, is only less wonderful than its coming into life from its resting spores in the spring when for a time there appears to be volition in its germs that seem to join it to the lower forms of animal life.

If we look in our gardens, out in our fields, in our vineyards and orchards, we will find fungi in some form to be our constant enemies. On some plants we may find them growing internally, and it is possible that when eaten in vegetables or grain, upon fruit or forage, they may be the active, inciting cause of many diseases. If their growth is upon stalks and leaves, we may find relief in the rotation of crops rather than to occupy the same ground year after year with the same thing, for it is now established that one species of fungus thrives only upon certain plants, not on all.

Another indicated remedy is found in the destruction of tops and leaves affected, such as the burning of strawberry leaves and potato tops. Methods of culture should perhaps be modified. Many forms of destructive fungi seem to begin close to the earth, and high training may not in this case be a bad plan.

We note these merely as suggestions for deeper study. At an expense of twenty-five dollars we have on foot an experiment in this direction in our vineyard, suggested by Prof. Trelease and our own observations. We shall be able to report next fall upon the result, and if successful believe it will open a vast field of progress hardly yet explored.

WHAT I KNOW ABOUT ORCHARDS.

By J. S. STICKNEY, Wauwatosa.

My knowledge of orchards, though not large, is somewhat ancient, reaching back some fifty years. Then as now my experiences were an odd mixture of joy and sorrow.

Great sources of pleasure were the red apples that filled

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my schoolboy pockets; new cider, direct from the press, was nectar fit for gods; painful and terribly depressing were the applications of the long, lithe apple sprouts.

So in later years, when visions of wealth have loomed up, mountain high, all tendency to conceit or pride has been wisely held in check by a simple codling moth or apple gouger.

Without due regard to the sore places in my experience, your secretary and others have desired to know all about that "Ninety and nine and one" Duchess orchard. Few men talk fluently about their failures, but I will at least give you facts. That orchard of five hundred trees is now some eight years planted, and as far as appearances go, seems prosperous. But as with some children of well-to-do people, the appearance of prosperity may be more the work of outside aid than of its own inherent, self-reliant forces. Coming down to facts, this orchard has for the past three years blossomed and set fruit enough, if matured, to give five hundred bushels annually of marketable apples, while all the fruit worth gathering in the three years has been about one hundred bushels. In size and thrift the trees have been amply able to carry and mature three hundred to five hundred bushels annually.

This is the simple though one-sided statement of facts which has gone forth, carrying with it the impression of failure; now for the additional facts to make a complete statement.

The location of this orchard is a warm, southern slope, on a very retentive, stiff clay, in all respects about as bad as it could be; but at the time of planting no better place was available. Drainage has been sufficiently good to allow of thorough culture.

This land has been much needed for the production of special garden crops, and in growing them has constantly been highly manured and freely worked. This has, of course, tended to free growth of wood and less fruiting.

Fifty, probably seventy per cent. of all fruit destroyed, is the work of the apple gouger. Of this I have no doubt, and I think I can account for his presence with equal cer-

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tainty. I have for years fostered and spared — just because they were trees — a multitude of unworthy, worthless apples, fancy crab apples, pet varieties of wild plums, etc., etc. These have annually produced some fruit; some years hundreds of bushels, all of which has matured, fallen to the ground and gone to decay. What more perfect conditions could I have made for the encouragement of the whole tribe of predatory insects?

If others are harboring similar trash, right here is the most valuable hint this paper will contain. I am now grubbing out these worthless trees and do not intend to spare any that cannot show a paying record. After ten more years I shall willingly apply the same test to this Duchess orchard, and I do not think it will have to be grubbed out.

I have not yet spent a dollar or a day's labor in efforts to get more fruit, because the garden products and the extra growth of the trees have seemed full compensation for any shortage of fruit, and I could afford to wait. Very soon now the management will be changed to an earnest effort to get fruit. Active cultivation will cease. No more manure will be applied, except as there are indications that it is needed. Some arsenical mixture will be thoroughly applied, and if that fails, all infected fruit will be hand-picked and destroyed. This last, though laborious and slow, is possible and *sure*, as the gouger reaches full maturity within the fruit. Before severe criticism or the verdict of "failure" is applied, I bespeak for this pet child of mine a few more years of probation.

With this paper in view I have been looking about to see if I really do know anything about orchards, and I "give it up," it is really an uncertain question.

I do some work and spend some money, guided less by positive knowledge than by a sort of blind faith in results. Perhaps I can best illustrate this faith by stating what I am doing.

I last spring planted three hundred apples in orchard — shall add another hundred the coming spring. From this you may infer that I still believe apple growing will pay — but the varieties will amuse you. First come one hundred

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Hyslop crabs. Of this variety I have four trees that for twelve years past have paid an average income of four dollars per tree annually. From all others in the list of choice crabs which have received ten years of praise and pushing, no case of really paying returns in ten-barrel lots and upwards has come under my observation. If there are such, their fortunate possessor should report them with exact figures, in the *Western Farmer*. It is a duty he owes to the variety and to his brother cultivators. If such reports cannot be made what further use have we for those crabs? Are they entitled to further probation, or shall we grub them out?

Of my other trees, only Golden Russet and Pewaukee are winter kinds; I know of no others that I think will pay. The balance are showy fall apples — among them Wealthy may be classed as early winter — such kinds as are hardy, productive and will handle well — keeping one to two months, long enough to pack and transport them to some ready market. Whether this selection is "wise or otherwise" will more clearly appear some fifteen years hence. If I am here I shall be glad to report.

You will readily see that this orchard is a commercial one, dollars and cents being the only aim. To furnish the most acceptable home supply, regardless of cost, the selection would be a different one, considerably more varied. In this selection, however, scarcely two planters would agree, so suggestions are useless.

[The following clipping, from *The Country Gentleman* of January 15, 1885, has a direct bearing on the subject under discussion:

"By the discussions on orcharding in the Chemung valley, as reported by the Elmira *Husbandman*, it appears that the apple orchards are mostly unproductive in that region. G. W. Hoffman is reported to have a fine growing orchard, which has received excellent attention, and after the trees had reached nearly a foot in diameter, and it was feared they grew too fast, it was seeded to grass, reducing the annual shoots to only a few inches in length; yet it still continues

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unproductive. The effect of top dressing with manure in causing productiveness is sometimes very striking, and if Mr. Hoffman could try it on a few of his trees it might lead to valuable results. One orchard had never borne a full crop, while another a hundred feet higher, and in the same neighborhood, was very successful, the trees five years after they came into bearing sometimes yielding five barrels to the tree. It was afterwards added that the owner of this productive orchard is a skillful manager, and attends to every want of his trees, which was doubtless one cause of his success. He had between 300 and 400 barrels of fine apples the past autumn, from about five acres of orchard. Young orchards sometimes have their bearing long delayed by too rank a growth; in which case seeding to grass and then *top-dressing with manure* have resulted in the best success. But it is important for those who plant large market orchards, to select such localities as actual trial has proved well fitted to producing good crops."]

Mr. Tuttle thought that while good, the Hyslop has reached or passed its prime as a paying market apple.

Mr. Kellogg laid upon the table specimens showing the work of the apple-gouger, the specimen (Golden Russet) being gnarled and dwarfed, of less than one-tenth the weight of fair samples of the same fruit.

The question being raised, Mr. Kellogg stated that the apple curculio was quite as abundant on trees remote from plum and crab trees as on those in their immediate vicinity.

Mr. Witt — Mr. President, after having suffered the loss of a good many hundred bushels of apples by the fellows whose work we see on the table, I have found a remedy. That remedy is somewhat connected with the pork question. About the last of May, hogs are taken from the artichoke field, their noses rung, and they are turned into the orchard. They very carefully hunt up and eat everything that falls. They run in the orchard till they are transferred to winter quarters. My part of the fruit is picked by hand and I have not seen the mark of a cur-

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culio or gouger, nor a wormy apple in my orchard for the last three years.

Mr. Palmer reported a greater profit from about fifty Fameuse trees than from the balance of an orchard of 700 to 800 trees.

Mr. Stickney stated that while occasionally perfect, the Fameuse is in most seasons entirely ruined by scab (*Fusicladium*) in the damp climate near the lake.

Mr. Hirschinger thought Mr. Palmer's failure with the Golden Russet was due to the soil on which the variety was grown by him; but this was said by Mr. Palmer to be a heavy soil,—admitted by the members present to be the more favorable for this variety.

On the question of exposure, Mr. Palmer stated that in his experience a west slope was more favorable than an east exposure for trees,—the cold east winds at the period of flowering doing great injury to the trees and flowers.

Mr. Jeffery reported the Pewaukee as discouragingly slow in coming into profitable bearing, in this respect resembling the Northern Spy.

In reply to a question, Mr. Jeffery said that he did not know of a winter apple to plant for profit beside the Wealthy.

The apple gouger was said to affect all varieties of apples, showing no partiality, coming every season and staying always.

Mr. Clarence M. Weed, of the *Prairie Farmer*, stated that in Michigan the gouger was not counted among the injurious species.

Mr. Witt — Mr. President, I have read and heard a great deal on the subject of tender and of hardy varieties of fruit. I have asked a great many fruit-men what constituted a tender or a hardy variety of fruit tree, and have never received an intelligent answer. With your permission I would like to talk a few minutes on this subject.

President Smith — We would like to hear you.

Mr. Witt — The variety of trees that mature their fruit in the fall and afterwards withdraw the sap from circulation, mature and drop their leaves before winter, will be hardy.

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The varieties of trees like the Roxbury Russet, the Baldwin and the R. I. Greening, that require a long season to mature their fruit, after the fruit is matured, have not time to withdraw their sap from circulation, mature and drop their leaves, and get ready to withstand the change from fall to winter. Such varieties of trees are tender.

Our long, pleasant, growing fall, and the sudden transition from such falls, to a sharp, crabbed Wisconsin winter, is decidedly against the longevity of our fruit trees.

Mr. Hatch stated that the growth of a tree old enough to bear was nominally determined about the middle or end of July; in his opinion winter killing is the result either of a weakness of constitution, or of a second growth resulting from injury early in the season, followed by a later stimulus.

NATURE'S SUGGESTIVENESS.

By MRS. IDA E. TILSON, West Salem.

It is proper that the first attention of horticultural societies be given to practical matters. This is a climate where, for about nine months of the year, a great deal of food and a great deal of fuel are needed. Whatever, therefore, adds to the yield, preservation, and profits of horticultural products, is of great moment. But there is an old saying about sermons in stones and lessons in running brooks. Whoever, then, builds a stone wall without hearing those sermons, or irrigates from a brook and learns not its lessons, has lost something. He who draws from nature's ample store only food for his body, and leaves untouched her equally generous provision for his soul, has missed, at least, half of life. Penn calls the country "the philosopher's library in which he reads and contemplates the power, wisdom and goodness of God." And Tennyson says of one single flower—

> "Little flower, but if I could understand
> What you are root and all, and all in all,
> I should know what God and man is."

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The horticulturist does not occasionally visit Nature, like poet, philosopher, and scientist. He dwells with her. Every day he may be a reader in her library, every day a learner in her school. He may continually feast his soul on her divine truths, and find that farm and garden work, usually considered as drudgery, presents its own noble opportunities for culture.

He who studies nature, sees her operations are not left to chance, but everything is done in law and order. The earth does not come in collision with comets, nor do stars fall upon it. The sun never forgets to rise, nor the moon to give her timely light. Even comets are known and catalogued. The seasons — summer's heat and winter's cold — forever follow in their turn. Men have not gathered grapes from thorns, nor figs from thistles. As a little poet among the Berkshire hills sings,

"The dimpled swells of fertile plains,
The boughs of trees, the roots of flowers,
  At least are always here;
For Nature keeps her sacred powers

  All 'round the year.
If, through the ceaseless round of change,
  One changeless Will appear,
Unmoved, undaunted may we range
  All 'round the year."

Only at rare intervals do earthquakes, hurricanes, and pestilence remind men of the fearful forces within this globe, from which its dwellers are protected by untiring love and care. And recent researches confirm the belief that such phenomena are themselves subject to law. T. Starr King, considering these things — possible earthquakes, famines, and other calamities, thought one might as well live in an uncaged menagerie, as on the earth, if it were not controlled by God.

The same nature which suggests law, also incites to obedience. That system of affairs which exists for man's benefit, is not suspended at his pleasure. Fire inevitably burns one. Exposure and gluttony ruin any constitution. If the husbandman lets his seedtime pass without sowing,

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the whole year is lost to him beyond recovery. "Time and tide wait for no one."

But proofs that the head of the universe rules in love are manifold. There are medicines for diseases, friends to set over against enemies, and means of defense. Sunshine is a panacea, and mineral springs furnish compounds ready-made. Gardeners find the friendly lady-bug pursuing the destructive potato beetle. Man has wisdom, the serpent has cunning, and deer are fleet. Many lizards have power to take on colors of leaves, flowers, and other objects around them, changing rapidly from green to brown, drab or violet. Others, living among rocks, have dull hues, equally protective. The ermine's snowy winter coat and summer brown suit, contribute another exemplification of compassion in Nature's Ruler.

Life is indeed sweet to men, and a future life their dearest hope. The natural world presents many changes analogous to death and resurrection. Winter's bare, brown trees give no hint of life deep hidden in sap and roots, till they revive in spring. Who could predict the worm would come forth from that death-like sleep in its cocoon, a gorgeous butterfly? Who could guess that an egg held within it, beak, talons, and wings, the future bird, destined to soar and sing in the clouds? Or who would, in bleak winter, imagine the flown birds nesting under southern skies? Who would suppose the helpless infant could, in time, become a man, strong and wise, traversing wide seas, chaining steam and electricity? That a higher form of life has ever succeeded a lower, is written on earth's very rocks. In the words of St. Paul: "That which thou sowest, thou sowest not that body that shall be, but bare grain, it may chance of wheat or of some other grain. So also is the resurrection of the dead." Of like import is this apt and beautiful expression from Victor Hugo:

"The tomb asked of the rose:
'What dost thou with the tears, which dawn
Sheds on thee every summer morn,
Thou sweetest flower that blows?'

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"The rose asked of the tomb:
'What dost thou with the treasures rare,
Thou hidest deep from light and air,
Until the day of doom?'

"The rose said: 'Home of night,
Deep in my bosom, I distill
Those pearly tears to scents that fill
The senses with delight.'

"The tomb said: 'Flower of love,
I make of every treasure rare,
Hidden so deep from light and air,
A soul for Heaven above.'"

Cemetery seems an affectation beside the quaint old name, God's Acre.

The bible is one succession of natural images. God's dealings with His people are more than once likened to the labors of the careful husbandman. In the cloud is still seen his bow, token of an everlasting covenant with man. Nor have the Pleiades yet lost their sweet influences. Christ spake in parables of the wheat and tares, the tiny mustard-seed and the barren fig tree, the savory salt and the pearl of great price. He pointed to his tender care of birds and lilies. He called himself the good shepherd, the morning star, and a well of living water. Scriptural miracles find their best explanation and defense in nature's ever-recurring miracles. Wine made from water, and multiplied loaves, are not unlike the pine-apple growing without roots and feeding on dew and sunshine.

Though Thoreau and Wordsworth are extreme cases of writers that have sought inspiration from nature, great authors are few who have not drawn their best illustrations and images from her resources, and this exclusive of those treating particularly on natural phenomena. Thoreau, you remember, found the pleasures born of sea and sky so many, he resolved to live alone in Walden Wood. He raised his own food, tried what the lower creatures could do for him, and sought to learn life's essential facts. Wordsworth wandered over the hills so often, and at such unseasonable hours, it is

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said a common expression with his neighbors was "Wordsworth is out mooning around."

From Bishop Heber down to B. F. Taylor writers have likened man's life to a river flowing into an ocean — the great ocean of eternity. Sometimes this stream holds a lovely picture of the sky and heavenly bodies, frequently a broken and imperfect one,

> "As the symbol of love in heaven,
> And its wav'ring image here."

Death, also, is occasionally compared to a river which must be crossed in passing from this land to a heavenly. But more often death is called a sleep, and how similar are the two in their restfulness, continued existence and ultimate awakening! Youth is the morning of life, noon its prime, and old age its evening; or, in a more extended figure, childhood is seedtime, youth a season of growth and labor, followed by autumn's fruitful hours, and winter's quiet contemplation and enjoyment of garnered treasures. And if, surrounded by October's gorgeous foliage, one rarely misses June's blossoms, it is suggested every situation and age has its compensations. Longfellow's description of Evangeline's gray hair might almost reconcile one to growing old.

"Then there appeared and spread faint streaks of gray o'er her forehead,
Dawn of another life that broke o'er her earthly horizon,
As in the eastern sky the first faint streaks of the morning."

Men are plants improved by culture. The wheat and tares, the sweet and bitter do indeed grow together for a time.

> "See how the lily swims the pool, a thing of grace!
> Though in the mire its root, no stain its fair leaf dims,
> So is the pure still pure, even in an unclean place,"

is a thought as old as the Brahmins. Harvest scenes have been especially suggestive. Some may have seen a bunch of golden wheat laid on a silent breast, or on a coffin lid, beautiful token of a ripe, rich and complete life. Tribulation at first meant threshing, from the Latin "tribulum," a roller or thresher. The deeper, religious use of this word

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was unknown to heathen classical authors, and belongs exclusively to later and Christian writers. Not until the grain is separated from the straw and chaff, hardly before its hull is torn away in the mill, does the full value appear. In tribulation, men by dropping worldly treasures and petty conceits, reveal their inmost worth. Like Ruth of old, may not gleaners yet find precious sheaves of truth and memory

"In the harvest-field of time"?

Men are fond of imagining themselves strong oaks, and women, clinging vines. The youth, when he wishes to describe his sweetheart's grace and beauty, calls her eyes blue as violets, her cheeks like roses, and her lips coral. He cannot do otherwise, for Shakespeare puts no better words in the mouths of his lovers. Every child has been reminded, time and time again, of the busy bee.

Images of sorrow and desolation are of great variety. Truly men are not always at their best, for birds cannot always sing, nor flowers perpetually bloom. And the skylark, cloud-bird though he may be, with his home in heaven, has his nest on earth. A friend lately spoke of the shadow of a great bereavement in which he felt he had walked for years. Life has many rainy days. The last of a family is the last leaf on a tree. Jean Ingelow's picture of an empty home-nest, after the birdlings have flown, is familiar to all. Frost breaks up mighty rocks, which, in their gradual wearing away, typify the disintegration of fortunes, states, and old institutions.

Nature undoubtedly has as many bright as sombre phases but man, "born to trouble," takes apparently less note of them, and the lambs, birds, and spring, really beautiful and joyous, have yet been made to do double duty.

There are many old adages and mottoes, of such a miscellaneous character, they cannot be grouped round any one central idea, which, used daily without any thought of their origin, will, when considered, prove to have been suggested by Nature. "Coming events cast their shadows before." "Distance lends enchantment to the view." "The shadow of a shade!" "Make hay while the sun shines." "Straws

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show which way the wind blows." "Still streams run deepest." "Wisdom is better than rubies." "A honeyed speech!" "Little foxes spoil the vines." "As snug as a bug in a rug!"

Some of them in rhyme are,

"As brave as a lion, as spry as a cat,
As plump as a partridge, as blind as a bat."

In this connection might be mentioned the seals of the states, whereon, besides implements of war and art, appear those of agriculture, together with the pine tree, the badger and the eagle.

Nature is not only a commentary on man's life, experience and character, but to some extent, also, a dictionary of single terms. Capricious is from 'capra', a goat. Accordingly the movements of a capricious person can no more be counted on than those of a goat. Rivals were originally dwellers along the same river. Experience, however, has proved water courses frequent causes of contention. Many cities and countries have had their names suggested by natural features of the localities. Bristol means a chasm, referring to that through which the river Avon finds its way to the sea. Buena Vista is a good view; Buenos Ayres, good air; Blair, a plain; Strathmore, a broad valley; Delhi, a quicksand; Roanoke, seashells; Chautauqua, a foggy place. Cambray means caverns, referring to those in which the inhabitants used to hide their goods for safety. Pawtucket suitably means at the falls; Pomerania, on the sea; and Poland, flat land. Capri was once noted for its goats; Marmora, for its marbles; the Azores for their hawks; and the Madeiras, when named, were wooded. Jamaica should be a land of springs, and Florida a land of flowers. All Margarets should be pearls, and Auroras fresh as the morning. Susan, in its original tongue, meant a lily; Esther, a star; Rhoda, a rose; Dorcas, a gazelle.

Nothing if not practical, is a favorite utilitarian measure of merit. Nature, happily, has done as much for art as for literature. Man but weaves the silk, linen, cotton and wool which nature provides. He tempers and moulds the metals

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she furnishes. Musical instruments were probably invented from a desire to imitate human voices and songs of birds. There is a tradition that Beethoven's Moonlight Sonata was actually composed under moonlight's bewitching influences. Ruskin bids painters paint nature as it is around them. The Greeks brought sculpture to perfection by making nature in her most perfect forms their models. Is not landscape gardening an imitation of her best phases? It is a general rule that no element shall be introduced into parks, which is not natural to the soil and climate. The cave is the type of Egyptian architecture, and interlaced boughs of trees suggested the Gothic. Before ever an arch of masonry was built, there was an arch of the human foot. Hinge joints in elbows and knees, ball and socket joints in hips and shoulders, serrated and beveled edges in craniums, ridge and groove joints in noses, preceded all carpentry and joinery. Among mechanical powers, all three kinds of levers are found in various parts of the mechanism of the human body, and in that of the lower animals. Dr. Hogeboom thinks that the inclined plane was naturally suggested from the advantages offered by slopes of hills. Hand, foot and span are all natural measures. The digits were doubtless once counted on the fingers. Lenses in all their modifications, telescopes, spy-glasses, opera-glasses, cameras, spectacles, are still on the plan of the human eye. A large number of animals bathe themselves, as elephants, deer, and birds. Those suffering from fever restrict their diet, keep quiet, seek dark and airy places, drink water, and sometimes plunge into it. Those afflicted with rheumatism, keep as much as possible in the sun. In view of a great number of such interesting facts, Delaney, the scientist, thinks hygiene and therapeutics as practiced by animals, may, with advantage, be studied in the interests of human physiology and medicine. Ants, bees, rats, and even buffaloes, have well organized and efficient governments. The young and wounded are tenderly cared for, but no drones nor tramps are allowed.

Nature having thus suggested or confirmed so many of man's religious, literary, and scientific conceptions, cannot, of course, leave unaffected his character. Dwellers among

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mountains are as steadfast as their own hills. Are not the orthodoxy, firm parental government, and industry of New Englanders and Switzers known world-wide? Is it not equally patent, that they who live on the great open plains of the West and by its broad rivers, are cordial, hospitable and generous?

Nature being that great school whence a whole world draws much of its education, cannot the horticulturist, while choosing and pursuing his practical avocation, imitating nature's distribution of seeds and care of plants, at the same time catch somewhat the spirit of poet, artist, and philosopher?

In conclusion, no one brief essay could be expected to exhaust a subject of such magnitude. In some of the illustrations and quotations, an entire separation of Nature from art and science, could only with difficulty be made, and was not attempted. No merit of invention is claimed for this production. Nature's suggestiveness has been recognized by all ages and writers. But these suggestions have been arranged in my own way, around my own ideas. The aim has been "*non nova, sed nove*," not a new origination but a new presentation.

SHADE TREES AND FLOWERS.

By Mrs. ANNA BRIMMER, Richland Center.

The true home is a place of love, liberty and repose—yet to those who love the beautiful of nature, no home seems quite complete without its shade trees and flowers. So general has this love become, that people of taste who live in cities and towns, never fail to admire a home with such surroundings. The pleasures and benefits of the floral world are enough to commend its culture to all. And happy is the man who finds delight in nature, who sees and is moved by beauty in trees and flowers. He is happy, for the source of his enjoyment is ever varying.

He that is wise, and would be well and happy, if as yet he has no garden, will not allow another year to go by without

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putting himself in the way of having one. It is the flower garden adjoining your door, from which you gather the greatest pleasure.

Here, you, yourself have seen to turning down the sod, have planted the seed, set the plant and waited for its blooming. The beauty of arrangement is the work of your own hands which makes it far dearer to you than if it were done by the hired hands of others. You were not afraid to soil your hands with the rich brown earth.

If trees and flowers add so much of beauty to our homes in town, would not a country home among all these become a gem of beauty? But the beauties of nature are largely unseen and unstudied, by the majority of farmers. Those who live in the midst of rural scenes are too much occupied with hard labor to appreciate and use what is about them.

It is a truth that cannot be denied that we all find time, more or less, to devote to the things we love. Still the farmer's wife may love flowers and think she has no time to plant and care for them; but as to shade trees, they take so little time and care, plant them in every corner, at the front of the house, at the back and on the highway along the border of your grounds.

I know of some homes in the country, that stand with bleak, bare walls, a lonely emptiness of door yard, not a tree or shrub near to turn the burning rays of the sun in summer or catch and stay the cold piercing winds from Manitoba in winter.

We need trees for shelter; but is that all? As to the question do they pay, put that thought away. The value of shade trees cannot be settled with figures; it is beyond that.

Let me ask you, do they not make a home happier or better? Does not the caring for shade trees and flowers lighten the labors of life, and ever make the home dearer where they grow?

Many of us can look back upon a childhood home surrounded by trees that towered aloft, whose branches clasped hands and flung a network of sunbeam and shadow across the threshold. It was those trees that brought the uncaged birds with their wild, free notes. It was in those trees you

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learned which was the blue-bird, which was the robin. Do not those trees seem like old friends? Did they not play a part in your bringing up?

The planting of shade trees and flowers will not be a benefit simply to yourselves; it is a gift to your neighbors, — to those whose happy windows chance to overlook it, — to those who come in and share what they can of its delights with you. The women and children as they pass, the dusty traveler as he drives by; all look and admire the nodding flowers and the cool, inviting shade, all grief, care and trouble forgotten for the moment. Perhaps noble thoughts have been suggested; surely, no evil ones.

If this be true, then, for the refining influence alone, is it not a duty as well as a pleasure to plant trees and flowers?

The love of home is in every heart. Let us foster and cherish that love by beautifying our homes with those silent teachers of the beautiful. And once more, remember it is not for ourselves alone.

For the children plant the pansy. Every child loves these flowers. They are pleased with the pert, intelligent look of the flower. One day last summer a little three-year-old, noticing a bed of pansies, cried with delight, "Oh mamma, see all the little cats looking at me." Those pansies were a world of pleasure to the child.

Many are apt to indulge in the mistaken idea that to make our homes beautiful requires a great outlay of time and money. Not so. A little money, taste, study and observation will produce the result.

The number of trees planted should depend upon the size of the grounds. Give to each tree room to perfect itself. We are apt to plant too many varieties in too small a space, which in time gives our grounds an uninviting appearance. This comes from want of forethought. The future growth of the tree has not been considered.

Some one has said, "He who plants a tree erects a life." Does he not also erect a monument that will be far loftier and grander than any chiseled stone that may hereafter mark his final resting place?

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FLOWERS IN THE HOME.

By MRS. ISAAC CLARK, Galesville, Wis.

When the beautiful flowers add so much to the happiness and refinement of our homes, why is there a home without them? There must be reasons and also remedies for these lacks. To acquire a knowledge of the one and apply the other, is worth our utmost exertion. Let us look directly at home and see if we have done all in our power to do, holding ourselves responsible for whatever is less than it should be.

Many say, "It is too much trouble;" a few, "I have no room;" others, "I have no time;" and some, "Flowers are an extravagance I can not indulge in." Too much trouble! What is better worth a little trouble than to brighten and refine a home with the ornaments of nature? No room! In this grand western land where ground is so free in its breadth and length and so cheap in comparison to the land in the eastern countries, it would seem that the "no room" excuse could only be cited by tho incorrigibly lazy. The "no time" excuse seems so perfectly absurd. Fifteen minutes a day is sufficient time to keep several flower beds in good order, if attended to with regularity and judgment. Who does not pass fifteen minutes each day less profitably? I know that some things must be crowded out of the possibilities of accomplishment in every woman's case. Let us see to it that it is not the best things that we let go. If we would consider that upon us depends, in so great a degree, the cultivation in those about us of refined tastes, and the lifting up of life into something higher and nobler than the mere doing of life's drudgery, we would exhaust less strength upon those things which are of less use to us and of so little value in the work of uplifting the little ones entrusted to our care. How many of us, women — over-worked women, too — who say we have no time to devote to the cultivation of God's lovely gifts, flowers, or to spend with our children amid the marvels and

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loveliness of nature, will patiently sit, hour after hour, stitching little pieces of calico or silk together to make some novel design in patchwork! Very likely as long as agricultural fairs will offer even fifty cents as a premium for such work, many women will be induced to spend their time thus foolishly.

A more valid excuse is the expense. To have flowers, something more than trouble, room, or time is needed. As soon as we attempt to prepare a piece of ground for flowers, wants present themselves. Where are the roots, seeds, plants, and cuttings to come from? We have no money. The earnings of the farmer must, in many instances, after the bare necessities are bought, go to purchase the means of making the farm more productive or labor more profitable. To be sure the old time lilacs, snowballs, and the pretty pæonies, the sweet cinnamon roses, and many others are easily procured and repay, with gratitude, the care bestowed upon them; but these are soon out of bloom and we have no flowers with which to brighten our own rooms, or the rooms of an invalid friend, or to send out on any mission which God has designed for the flowers, and which it is a pleasant privilege of every floriculturist to further. And then, too, the humble country girl that has had an occasional glimpse of the lovely flower gardens in the neighboring town, has the ambition and desire to have as pretty a one; and such a garden would do much towards making her rural home a desirable home for her and her brothers and sisters.

Did it ever occur to any of you ladies in the city who have so much time and means to devote to the cultivation of flowers, that amidst all your charitable deeds this matter is overlooked? Have you ever thought how much good you might accomplish in saving seeds each year to distribute to those unable to purchase? How much happiness could be shed abroad by giving your surplus plants, cuttings and bulbs to the enthusiastic lovers of flowers, who are unable to procure the choicest of God's ornaments! Many of you, no doubt, do give; but have you reached any of the poorer classes living in rural homes? Do you ask how this can be done? If you insert an article in any of the papers to the effect that

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you have a surplus quantity of seeds, etc., to give to any one unable to purchase, I am sure that an opportunity will be afforded you for giving them all away, and you may thus increase your power of good. If only the spirit of the flower charities of the city could extend into the country, it would bring to the rural homes a new and delightful pleasure, and all participants would not only help others, but would add usefulness and happiness to their own lives.

Winter-bound as we are, for more than half the year, it affords a great amount of happiness to have a little summer gladness in our homes. When the skies are lowering and the winds fierce and torturing to the world outside the house, what a charm then is a window of plants, or even a green spray that leans and nods toward every gracious influence! How sweet and dear is the unfolding of a single blossom that comes forth under our own care, while all its comrades are asleep in the ground outside! It greets us with cheerfulness and beauty, giving us sweet assurance that we have not had our trouble in vain. The presence of flowers refines, beautifies and sweetens life. They do much to develop the love of the beautiful, good taste and order of the children of our homes, and with their refining, elevating influence, will ever lead them upward to the great Creator.

Of all earth's flowers, the children, "the flowers of our household," should receive the tenderest cultivation and care. The first few years of their life are spent almost exclusively in the home with the home surroundings. Their strongest impressions are made in their younger days. It is in the tender years of the child's life that the disposition is formed. Its mind is perfectly void until it has seen an object, then thought comes into action and that thought leaves an impression on the mind. Each day some new thought of sin or of purity is born into the tender heart and that thought lives forever. How necessary, then, that the surroundings of our little ones should be of the purest kind, of a character to tend towards ennobling and refining the child's nature! O, mothers! if we could only cast aside all cares and troubles when we approach our little ones, and let the sunshine of cheerfulness shed abroad into their tender

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little hearts and inquiring minds, how many more genial and sunny natures would be developed in this world. A pope once said could he have all the children under his care till they arrived at the age of five he would have all Catholics. This may be a strong assertion, nevertheless it is true to a high degree. This being the case, if we give our little ones the right training and surroundings till they are old enough to go from us to the schoolroom, we will have less cause to tremble for fear of contamination.

The influences of a happy childhood will never die. Its pure, simple, earnest joys become wells to draw from, whenever we sit down in thirst and weariness by the dusty highway of life. The sunshine in those days reaches across our short stretch of life and mingles its rays with those that beam from the heaven of our hope. The indigestible material which we lay up in the receptacles of our memory in so great an abundance we appropriate to the refreshment and nourishment of our own souls as we live over and over again the past. How sad life must be to the one who can never turn back to the memories of his childhood with a happy heart! What must be the fate of his parents or guardians?

Many a child goes astray, not because there is a want of prayer or virtue at home, but because home simply lacks sunshine. A child needs smiles as much as flowers need sunbeams. It needs neat and tasty surroundings as much as they need the enriching qualities in the ground where they are placed. Children look little beyond the present moment. If a thing pleases them they are apt to seek it, if it displeases they are prone to avoid it. If home is where faces are sour, where fault-finding is in the ascendant, where scolding is frequently indulged in, where the surroundings are not pleasing, rest assured they will spend as many hours away as possible. If we would have them attain to a great perfection of mind and character, it behooves us to try to be happy; to look happy; to talk to our children, especially the little ones, in such a manner as to make them happy; to furnish them with pleasant surroundings and healthful reading; to occasionally stop by the wayside of life and exchange tokens

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of affection. These little haltings in the march of life will not only do much toward germinating the noble qualities in their character, but will keep us young and sympathetic.

Children are imitators, and the best manner to teach them true politeness is to be polite to them. The best way to keep them from forming bad habits is to refrain from indulging in bad habits ourselves. There is food for thought in the story that is told of a young lad, who for the first time accompanied his father to a public dinner. The waiter asked him, "What will you take to drink?" Hesitating for a moment, he replied, "I'll take what father takes." The answer reached the father's ears, and instantly the full responsibility of his position flashed upon him. In a moment his decision was made, and in tones tremulous with emotion, and to the astonishment of those who knew him, he said, "Waiter, I'll take water."

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THE RELATION OF POULTRY TO HORTICULTURE.

There is an old newspaper joke, which claims hens, like plants, are set, and eggs resemble roses, being propagated by layers. This paper, however, proposes to treat its subject in real earnest. Neither horticulture nor poultry-raising requires large capital. A little money buys many seeds or fowls. Either business is most practicable on small areas. Poultry cannot range like stock. A few acres of fruits and vegetables, with their constant weeding and cultivation, are equivalent to the demands of a whole farm planted in coarser crops. It is therefore surprising that he who has a small capital, a small farm, or both, does not oftener combine two such harmonious industries. When statistics of either business are considered, it is equally strange that men will risk new country privations to secure large farms, instead of subdividing old lands in settled communities, and trying these remunerative employments. A late paper estimates the French eat, on an average, one hundred and fifty eggs apiece each year. In the United States about $30,000,000 worth are annually consumed. Not long since, some statistician astonished one of Wisconsin's well developed counties by proving its horticultural products had, that season, netted more than its combined stock and dairy interests.

Often two crops, fruits and fowls, can be grown in the same enclosure without detriment to either, but on the other hand, with great advantage to both. If a flock are, in number, proportioned to the size of their run, they will cultivate the ground well, allowing no hard crust to form on its surface, nor weeds to flourish, and will tear apart, pulverize and work up into a compost all sorts of old rubbish. Biddy's

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worst enemies admit that she can do that to perfection. Many grubs and insects, conveyed to vegetable quarters and flower beds in fertilizers, are found and eaten. All this while the birds themselves are enriching the land. The guano of commerce not always comes from Peru, but sometimes has its origin in American poultry yards, and is all the better for that, as chemists think no fertilizer is superior in condensed strength to this home-made product. Can earthworms, so praised by naturalists, do more than biddy has done thus far? Then is she not entitled, when warm weather comes, to sit under shelter, so to speak, of her own vine and fig tree? Trees and plants afford a sure protection from hawks. Poultry need shade for comfort, and, throughout the year, green food for health. Undersized and injured vegetables, of all kinds, seem to suit their tastes and constitutions quite as well as sounder roots. What horticulturist hasn't unsalable produce, a dead loss, except as swine or fowls transform it? If this subject were a little broader, agriculture instead of horticulture, the market fowls make for cereals would be an important consideration, also their utilization of screenings, etc. The chemical constitution of a soil is believed to affect the color of their plumage, not so much by direct contact, as through the digestive organs and blood, because they eat not only vegetation growing out of this soil, but more or less earth itself. A variety and abundance of mineral matters produce dark and vivid tints. Lime and phosphorus tend to symmetry of form and vigor in carriage. Ammonia induces sprightliness. Gardens are yearly enriched with fertilizers, both natural and manufactured, which contain these very elements, and such situations cannot but prove favorable to producing high-bred poultry.

Horticulturists wage constant war on insects, and make a large annual outlay for powders and other compounds to destroy these pests. But the New York *Tribune* says: "London purple, Paris green, and other deadly and enduring arsenical preparations may well be included in the black list. It is time honored entomologists ceased to lend their influence in favor of such perilous stuff, which, recklessly scattered as it is in immense quantity, poisons the land and the

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fountains of life." The *Rural New Yorker* unites in this protest. Not that any person or many animals have actually been fatally poisoned, but, as in adulterations of sugar, syrups, etc., injury is no less because it comes on gradually and insidiously. Insectivorous birds and animals, on the contrary, are natural and safe allies for horticulturists. Prof. King, of River Falls, who has examined the stomachs of many hundred birds, thinks not more than thirty-five per cent. of the robin's food is fruit, and, therefore, commends this generally distrusted and persecuted bird. As fowls are usually made to fast a while before being killed for market, it is difficult to determine just what proportion insects form of their food. An acquaintance tried, by dissecting a number of sick individuals, to learn the secrets of some mysterious malady visiting her flock. She was surprised at the large number of familiar insects found in the crops even of those partially disabled hens. At least cherries, raspberries and blackberries grow out of reach of fowls, and it can fairly be inferred they destroy less fruit than robins do. Let a few additional plants be allowed for them, and they will save all from overbearing, a thinning out by hand not often being practicable. Moles have many friends, and toads are a regular article of commerce, being imported to England from Denmark at the rate of five dollars per hundred. But moles frequently eat off roots and make unsightly mounds of earth. And finally, in the comparison of merits, domestic fowls cannot fail to outrank wild birds and insectivorous animals, because, unlike all others, they are themselves a source of profit. Here again is reverse action. With insects or some other meat for food, an extra production of eggs may be expected.

A list of such injurious insects as poultry are actually known to eat will add positiveness. A friend has called my attention to the Illinois Horticultural report of 1883, on the chicken remedy for sorghum plant lice, and the Michigan Pomological report, of 1877, on the same remedy for curculio. Not only plums, but apricots, peaches, cherries, apples, pears and quinces are attacked by curculios, hardly a fruit escaping if these insects are abundant. When plums are about

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as large as peas, the curculio stings them, making incisions in which she deposits her eggs. Fruit weakened by the gnawing of the grubs which hatch, falls before ripening, but by this time its grubs are ready to pass through other changes.

Prof. Kneeland, of Boston, says poultry running about the trees will devour many larvæ before they can enter the earth. Full grown insects, shaken from a tree or disturbed, remain motionless, feigning death for a time, when possibly they might also be discovered and eaten.

Prof. Sturtevant, of the State Experimental Farm, at Geneva, New York, placed a dozen hens in an enclosure of fifty trees. Only three per cent. of plums were stung, while all outside were ruined. Pea weevils proceed in a similar way with half-grown pods. In a row of peas, where I had discovered these pests, not one could be found after some hens had investigated them, and a fine crop resulted. It is generally admitted that crow-blackbirds and Baltimore orioles devour great numbers of these weevils. So many have actually seen poultry eat potato bugs, especially young bugs, their names would make too long a list, though among them may be mentioned J. C. Plumb, of the *Western Farmer*. Cut worms remain under ground by day, and their only effectual preventive is frequently to dig about infested plants and kill what worms are found, surely a suitable work for chickens; and Secretary Gibbs, of this society, testifies he has had several hundred strawberry plants thus cleared of worms. He also mentioned a neighbor who bought five hundred or more plants from him, and gave his chickens full range among them. They were free from the leaf-roller's ravages, while Mr. Gibbs' own plants, not so cultivated, were injured. Wire worms are often hurtful to wheat and garden crops, including strawberries and potatoes. I cannot please my hens better than by disclosing a haunt of these insects, unless indeed, I gather the worms myself and feed them out in a mass. If the biddies cannot, like Oliver Twist, call for more, they look their appreciation. Snails and slugs are less common here than in European gardens, where, on the authority of Appleton's Cyclopædia, they are often too

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numerous, and the matter is remedied by fowls. Angleworms, in great numbers, sour or poison soil, and no one of any experience in gardening can deny hens' fondness for them, nor for that famous corn and grass destroyer, the white grub, as well as for grasshoppers, which also become formidable through numbers. Biddy will trudge behind a plow half a day at a time, devouring grubs thus brought to the surface. President J. M. Smith, of the Wisconsin Horticultural Society, is as noted for his fine currants as for his leniency to hens. The late Mrs. Lewis told of a friend in Mazomanie, Wis., whose roses, free from slugs, are a perpetual wonder. Their owner, however, divides all compliments with the feathered helpers. I have seen poultry eat bee, wheat, and cabbage millers, and in fact various others, which I have not identified. This is an important consideration, for all kinds of plants and trees, fruits, grease, meal, clothing, carpets, and furs are subject to the ravages of moths. Any warm sundown, when millers are flying about, young chicks with all youth's enthusiasm, may be seen chasing them. A hen will stand motionless over a cabbage plant half an hour, Micawber like, waiting for a miller to happen along. Such an authority on southern horticulture as Ex-Commissioner of Immigration Dr. S. French, of Florida, expressed to me his high valuation of hens in orange groves.

Training doubtless will avail much. A friend tells of a pet cockerel that came at his call to dig for worms. A hen of mine, Twilight by name, was equally acute. Another, Gertrude, having been fed many wood-grubs, to this day lingers about wherever she hears an axe.

A correspondent of the *Country Gentleman*, in an article which has been widely quoted, rather sneers at the guesswork of those who praise fowls for fruit protectors. I have, therefore, made my statements as definite and minute as possible, and extended my observations and inquiries through more than one season. He has, for instance, repeatedly offered his hens curculios, which they would not eat. That there might be no failure to see them, he laid his specimen beetles on a white plate. Now you are all witnesses that hens are not accustomed to dining on china.

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Where one bird would catch the idea of such an experiment, ninety-nine would stand agape at the man's manoeuvers. That I might demonstrate his folly, I have served their favorite angleworms, white grubs and crickets, in style, on plates. Only one or two of my flock, and those known to be especially bright and aspiring individuals, would partake. Insects eaten freely in their own way and time, they are generally too startled to notice or accept when thrown at them. Such is not a fair test, either, for those friendly and helpful bugs which horticulturists do not wish destroyed.

To know positively what animals do not eat, would require an almost omniscient eye. Under a great variety of circumstances, I have known these birds we are considering to pass unnoticed or to refuse the valuable lady bug, destroyer of plant lice and potato beetles. A lady friend, a great lover of gardening, sustains me in this statement. Man can hardly estimate the benefits conferred on him by the little ichneumon flies, which keep in check gall insects, Hessian flies, caterpillars, potato worms and a host of others. But these flies are very rapid flyers, and taken with difficulty. I have never seen fowls attempt their capture, although they are so common. Professor Trelease, of the Wisconsin University, calls the golden-eyed or lace-winged flies too fetid for anything's appetite. Dragon flies, beneficial by destroying gnats and mosquitoes, are also exceedingly swift in their movements, and not only that, but high in their flight. As they frequent pools and aquatic plants, not one poultry-yard in a dozen is so located as to give its inmates even an aquaintance with them. Prof. King unites with Prof. Trelease in a belief that chickens can, from the nature of the case, do no considerable damage to useful insects. The *Gardeners' Chronicle* is not afraid to take the same stand.

Perhaps no one will object to such conclusions as have been reached. It is, however, for her supposed wanton and unnecessary destruction, her scratching up things, instead of cultivating around them, that biddy is chiefly hated. Is not her aim, extermination of bugs, and her injury to plants, incidental or accidental? Her purpose

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accomplished, does she ever again disturb the spot? The peas, before mentioned as attacked by weevils, we thought ruined by those hens which overhauled them. They were twisted everyway; some plants nearly uprooted. In a few days, though, they straightened up, took new hold, and yielded excellently. Now, their work done, did our feathered gardeners ever return to them? A fence a yard high knit of coarse carpet-twine, in meshes an inch square, and, at intervals, fastened top and bottom to slender poles driven fast in the ground, is said to make a complete barricade against poultry of any kind. It is graceful, nearly invisible and suitable for hedging in flower beds. Mosquito-bar, though less durable, answers very well, so reports a *Western Rural* correspondent. Mr. Hildreth, of Massachusetts, owner of a large establishment, a farm, six hen-houses, eight hundred hens, etc., finds a movable fence, one lath high, made in sections, keeps them in bounds. Nor when brought up in a garden from the first, are they so likely to do damage as when they are only allowed in now and then, or get in by chance, reminding us of the hungry boy at a picnic. Our hens have access to all the premises, and we have an abundance of garden stuff to bestow on our neighbors, as a consequence, we believe. Undoubtedly, too, there are seasons and occasions when fowls will have to be confined in their yards.

The relation of poultry to horticulture is a worthy study, yet in no sense is this paper expected to be decisive. Its aim is suggestiveness. How much loss and disappointment jumping to conclusions has occasioned in every industry, cannot be conjectured. Hens have been referred to most often because I am best acquained with them. Ducks and geese are not practicable in every situation.

Turkeys are more voracious, but their crops are fatally tender when young. A clipping from a California paper says: "The wine-growers whose vines are suffering from the ravages of slugs, are employing turkeys to devour these pests. The thing works well. The turkeys like the slugs, the slugs cannot get away, the vines are saved from destruction. The owners of slugs, vines and turkeys are contented.

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Turkeys grow fat while thus earning their own living, for one of them is said to destroy more slugs than two men can." A New York paper tells of a farmer who keeps a drove of turkeys, and rents them out to other farmers whose crops are troubled by grasshoppers. They were found, in that section, good to destroy potato bugs also.

Some aesthetic and ethic considerations deserve a passing notice in conclusion. Mrs. R. B. Hayes, wife of Ex-President Hayes, is noted for her exquisite taste. A late visitor to their Ohio home enthusiastically declares she owns some of the finest fowls west of the Alleghanies. Stone deer, favorite ornaments on lawns, seem incongruous unless grounds are large and romantic, A live deer would certainly be out of place in confined areas, and among choice evergreens. A flock of hens in which there is choice of color from black, white, red, yellow, to ringed, streaked and speckled can be made as effective as a flower bed and far more kaleidoscopic. Like man, biddy does not wish to live and die "unwept, unhonored and unsung." No animal responds quicker to application. Let her see she is liked and valued and she rises constantly in the scale of intelligence, is obedient through life, and, after death, lives in the memory of those who eat her.—MRS. IDA E. TILSON, *in Report of Minnesota Horticultural Society.*

THE PETUNIA CURE.

Mrs. H. M. Lewis has written pleasantly and suggestively, in the *Western Farmer,* of a discouraged young woman, who, having worse than wasted her substance on doctors and druggists, at last had the good fortune to meet a true friend of sense, who plainly told her she had fooled away time and money enough in this demoralizing atmosphere of medicine, shut out from the fullness and life of God's sunshine and pure air. So floriculture was prescribed as a certain and pleasant panacea.

"Try cultivating the petunia in the highest style of art. Search the catalogues and get the best seeds and plants.

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After that prepare the soil; let it be rich mold, and guano. Stir and work it all yourself, and before the summer is over you will be as well as any of us."

In sheer desperation, and with feeble faith, she acted on this hint, advanced by easy stages, and is now healthy and happy, and naturally enough, enthusiastic about the chosen plant which was the agent of her rescue.

First, she obtained the best possible seeds of single varieties; next purchased from the greenhouse young plants and cuttings of double and semi-double varieties; these were put out in the garden as soon as the weather permitted in the spring, and when the flowers appeared, if one of inferior quality was seen it was ruthlessly pulled up. In this way she succeded in getting only true, free-blooming, brilliant flowers. They showed themselves in many shades of rose-color, brown, pink, purple, crimson, white, dark violet, and three varieties of green — one of them of great size. Some were fringed, others blotched, striped and bordered, while others were covered with a net of purple, green or brown. Some of the flowers were as small as a ten-cent piece, others as large as a hollyhock; and one year she originated four varieties of double ones — one a pinkish flesh color that would have been a treasure had a professional florist originated it. Was it astonishing that scores of visitors came from far and near to see the beautiful flowers that were the talk of the country? In growing these flowers, she, assisted by the bees and insects, slightly interfered with nature's workings. The pollen from one flower was carefully sifted upon the pistil of another, and by thus impregnating some of the flowers, rare, beautiful ones were produced that astonished herself and friends — for a number of her hybrids were entirely new. When the double and single are fecundated in this manner, the result is a double or simi-double one. This is the only way by which seeds can be obtained from double varieties

A friend who started in the nursery business with one acre of land and now has 400 acres, devoted to all manner of ornamental plants, said in a recent note to us: "If women, and men too, would spend more time in the open air,

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with a little light labor, there would be fewer doctor bills to pay. I should not be here to-day had I led an indoor life. Of this I am well assured." — *New York Tribune.*

THE TUBEROSE.

During the last fifteen or twenty years no other flower has risen to such prominence nor assumed as great a commercial value as the tuberose. Formerly a florist was content to possess 50 or 100 bulbs. Now each of the leading firms grows as many thousands. When the excitement for cut flowers began to develop this was selected among the first, on account of easy culture, pure white color, delightful fragrance, and favorable keeping properties after cutting. To some people the odor is overpowering, especially in closed rooms, but the demand for the bulbs appears to suffer no diminution, but has increased, if anything, within the last two or three years.

The tuberose was first grown extensively in the vicinity of our large northern cities, but in view of the longer seasons and warmer atmosphere of the south, thousands of bulbs have been cultivated there and shipped to northern markets. It is questionable, however, whether such bulbs are intrinsically better; some dealers claim they are inclined to be spongy and imperfect, although of larger size. American bulbs, for a time, almost drove the Italian-grown article out of the English market, the former affording a larger percentage of bloom, but now they are succeeding so well in Africa, our foreign trade in bulbs has a tendency to suffer in consequence.

The tuberose delights in a deep, rich, light soil, with a southern exposure, to lengthen the season as much as possible, at the north. The occasional early frosts of autumn frequently destroy the flower-buds or the bloom, before it arrives at maturity; hence any assistance we can render our plants to hasten the flowering season is a great point gained. This is partially accomplished by potting the bulbs and slightly forcing them before planting in the open ground, a measure feasible in a limited way, but rather ex-

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pensive for the culture on a large scale. Such plants, it is thought, are rendered weakly, and do not, as a rule, yield so large a percentage of bloom as those grown in the usual way. Beginning with the small bulblet or offset, it takes about two seasons to form a first-class or flowering bulb — the third summer usually finds it in perfection, after which it deteriorates, somewhat after the manner of many bulbous plants, as, for instance, the hyacinth.

It seems to be pretty generally conceived that the tuberose will bloom but once. This is certainly erroneous, as I have tested bulbs with special care to ascertain their capacity to bloom continuously for a succession of years, and the spikes were produced regularly. However, a marked diminution in quality was plainly perceptible. For open air culture, the old double-flowering variety, or as it is sometimes known, the Double Italian, is perhaps unsurpassed for general cultivation The Pearl, introduced a few years since, is not so tall, but with larger flowers, and is better adapted for house culture. The single form is pretty for cut-flower work, reminding one of orange blossoms, both in appearance and fragrance.— Josiah Hoopes *in New York Tribune.*

THE VICTORIA REGIA.

HISTORICAL REMINISCENCES.

It was our privilege to see this queen of the water lilies in bloom at Kew Gardens, England, October, 1878. There was a display of water lilies from all parts of the world, in every witchery of form, color and odor — pure white, soft rose-tinted and deep pink, and the loveliest blue. But the most entrancing for form, color, size, and fragrance was the Victoria. She shone, indeed, as the empress of the entire floral dominion.

The present generation cannot realize the interest taken in this superb plant nearly forty years ago — the intense desire to get specimens to Europe, the great efforts, and the provoking failures. Even the seed would refuse to germinate. At last, it was taken over the sea in its native water,

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and painful care was had as to temperature — even periodical agitations of the fluid, as if to deceive the coy embryo into the idea of the flowing of its natal stream. When success was attained, it was accounted among the florists of the world as "the big thing of the age." But the conditions of success were so costly: a glass house, a tank of thirty feet diameter, and the water steadily kept up to eighty degrees temperature; private means, unless munificent, could not suffice.

The leaves of the plant are six feet in diameter; they are green above and red underneath, suggestive of the color habit of the foliage of the Begonias, especially *B. sanguinea,* though it should be said that, as a rule, the water lilies have the underside of their leaves of a liver-red, or purplish. These gigantic lily leaves, speaking popularly, are, when full grown, round, and, with the edge turned up two inches or more, look like immense floating tea trays. Large aquatic birds stand on them by the hour, watching for fish to pass by. But those great leaves are ribbed in a most ingenious way, imparting immense strength; so that with a board properly arranged to distribute the pressure, a prodigious weight can be borne. I have some notes which I think were made some thirty years ago, from which we will extract, though the figures seem incredible. It was stated in *Science pour Tous,* that in the aquarium of the botanical garden at Ghent, the head gardener, M. van Houtte, was interested to learn the force required to immerse one of the floating leaves in the water. One leaf supported a child; another was not submerged by the weight of one of the gardeners. He was led to experiment as to the limit of this resistance — loading the surface of one of the largest leaves with bricks. It was found to bear a weight of 760 pounds avoirdupois — that is to say, nearly equal to five men of average weight.

The first successful effort to bring the *Victoria regia* into bloom in England was in the world-famous botanical gardens of the duke of Devonshire, at Chatsworth House. Joseph Paxton, the duke's head gardener, constructed the great glass house for its accommodation, which took the name of its gorgeous occupant. The hint for the construc-

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tion of this fairy-like building was derived from a study of the structure of the Victoria's leaf.

We may, in passing, say that Mr. Paxton designed the Crystal Palace for the World's Fair in England, 1851, built chiefly of glass and iron, all being primarily due to his study of the leaf mentioned. For this achievement he was knighted, and thus became Sir Joseph Paxton.

The first flower of *Victoria regia* in England, was in November, 1849. The event brought together a distinguished concourse of visitors of the nobility and *literati*. A novel event was the appearance, on the occasion, of little Miss Annie Paxton, who, dressed in costume of a fairy, took her place in one of the tray-like leaves, and, like a Naiad of the waters, presided as the fairy guardian of this beautiful floral queen. Such an event could not be less than inspiring; accordingly the muse of the famous Douglas W. Jerrold produced the following:

"On unbent leaf, in fairy guise
Reflected in the water,
Beloved, admired by heart and eyes,
Stands Annie, Paxton's daughter.

Accept a wish, my little maid,
Begotten at the minute,
That scenes so bright may never fade,
You still the fairy in it.

That all your life, nor care, nor grief
May load the wingéd hours
With weight to bend a lily's leaf,
But all around be flowers."

It will astonish some to be told that the *Victoria regia* was made to flower in a tank in the open air by Mr. E. D. Sturtevant, at Bordentown, N. J., last August, the water being kept at its right temperature by pipes. I was one of a small party invited to witness the event, but was far away at the time. An enthusiastic friend wrote me about it, and what follows is mainly from his letter: At the first visit the leaves were six feet across, with a rim about two inches high, and a bud just visible in the depths. It was expected

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to bloom in two weeks, and we intended to go again with yourself, Mrs. Treat, and others. Alas! the bud shot up with almost visible rapidity, and bloomed on Sunday evening. I saw it at its second opening, when it was somewhat the worse. At its first opening, the flower rested on the water, a pure white blossom a foot in diameter, and filled the air with a delicious pine-apple perfume; at its second, it was raised above the surface, the petals had become a pale rose, and were strongly reflexed, while the perfume was entirely gone. The stamens were a deep rose color, and folded down, so as to completely cover the stigma, etc. On this second evening, a strange event took place, which we unfortunately did not see, as we had to go to the train, but which was communicated by those who did see it. About half-past seven P. M. the stamens suddenly lifted themselves, and with quite a perceptible jerk shook a mass of pollen down on the stigma. It seems hardly credible, but it is true; this Victoria had produced four great leaves, with another partly unrolled, and had bloomed, all from a plant six inches high, with one small leaf, in just four months. One would think that the forming of its cells ought to be visible with a hand lens.

To give completeness to this little sketch, let me quote from the *American Cyclopædia:* "The flower is of two days' duration. The first day it opens about 6 P. M., and remains open until about the same hour next morning; in this stage it is cup-shaped, twelve to sixteen inches across, with numerous pure white petals, and emits a delightful fragrance. The second evening, the flower opens again, but it presents an entirely different appearance; the petals are now of a rosy-pink color, and reflexed, or bent downward from the center, to form a handsome coronet, but now without odor; the flower closes toward morning, and during the day it sinks beneath the surface to ripen the seed.—Prof. Samuel Lockwood in *The Canadian Horticulturist.*

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THE CLEMATIS.

This is one of the most beautiful and popular of garden flowers. It is a member of the Crowfoot family of plants — to which also belong the columbine, anemone, meadow-rue, larkspur and pæony — and abounds throughout the temperrate regions of the northern hemisphere, and occasionally occurs in tropical and subtropical parts, both north and south of the equator. But beyond the New Zealand species, indivisa, which is a winter-blooming, profuse, white-flowered, showy kind, and a greenhouse plant with us, the hardy clematises only appeal to our notice.

Everyone knows the common wild Virgin's-Bower (C. virginiana) that drapes the branches of the trees, mantles bushes in the thickets, trails over rocks and banks, and is so lavish of its flowery wreaths in summer, and fleecy akenes in the fall. Europe yields us others not unlike it. The Traveler's Joy (C. vitalba), rougher, may be not so pretty; and C. flammula is a neater and more copious plant, with whiter and sweet-scented flowers. From the higher mountains of Chinese Tartary comes the C. graveolens, a fragrant, yellow-flowered species, perfectly hardy in our gardens, a rampant grower, whose akenes in the fall are flossier, whiter and more abundant than those of other common garden kinds. From Texas comes C. coccinea, with orange-scarlet flowers, shaped like those of our common leather-flowered clematises, as pitcheri and viorna.

The above, being vigorous vines, hardy and profusely floriferous, are well fitted for use as screens in front of the veranda, to cover naked stumps or tree trunks, envelop rocks or tree roots, or face lattice or other fences used to screen unsightly objects. Both coccinea and flammula are worthy of special care.

But the large-flowered clematises so greatly favored in our gardens, are of a different race, and jackmani may be

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taken as the best as well as the best known among them. Jackman, of England, claims it as one of his first hybrids; that he raised it in '58, and bloomed it for the first time in '62. Now comes the eminent French arboriculturist, A. Lavalée, and declares it to be a Japanese species called C. habonensis. No matter, it is a capital garden flower; so are the whole set of its kind, C. lanuginosa, patens, florida and the rest of them. But as some of them blossom in spring, others in summer and others from summer into fall, and as the earlier-blooming ones flower from old wood, and the late seasoned ones from the young wood, we require to know something about them in order to be able to treat them intelligently.

The "patens" type represents the spring-bloomers. They bloom from the old wood, and are in beauty when the azaleas and rhododendrons, bleeding-hearts and oriental poppies are in perfection. A vigorous growth should be encouraged in summer, and no pruning be done in fall; but all the wood possible should be retained till spring; then, after the plants are out of bloom, we may prune if need be. Lord Londesborough, mauve; Lady Londesborough, silver gray; Miss Bateman, white; The Queen, lavender; Vesta, white; Stella, violet; Albert Victor, lavender; standishii, mauve-purple; and Sir Garnet Wolseley, bluish, are good varieties of this kind. Countess of Lovelace, bluish-lilac; Duchess of Edinburgh, white; fortunei, white; and John Gould Veitch, lavender-blue, are double-flowering clematises coming in with, or soon after, the preceding single ones, and requiring like treatment, except, perhaps, a more sheltered position, or to be taken down and covered with earth in winter, as we do with raspberry bushes or grape-vines.

The "lanuginosa" type represents the large, showy-flowered varieties that come into bloom in midsummer and continue more or less for a month or two. They bloom from short lateral growths from the old wood, hence we should be careful to preserve as much old wood as possible. Lanuginosa and its varieties, lavender to white; henryi, creamy white; alba magna, white; gem, lavender; William Ken-

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nett, lavender; Morikata Oké, satiny white, and Otto Frœbel, grayish white, are good sorts.

The "viticella" and "jackmanni" types include the well known hardy race whose showy, purple flowers are so familiar in our gardens in summer and fall. They blossom successively on the current Summer's shoots; hence are benefited by being shortened back in winter. All things considered, jackmanni is the best among them. But there are others also of exceptional merit; for instance, Lady Bovill, grayish blue; Mrs. James Bateman, lavender; Thomas Moore, pucy violet; viticella rubra grandiflora, claret; Alexandra, reddish violet; Prince of Wales, pucy purple; Rubella, claret purple; Star of India, reddish plum; tunbridgensis, bluish mauve, and velutina purpurea, dark mulberry.

Clematises love good treatment, rich, well-drained soil, a sunny situation and protection from cutting winds. A mulching over their roots in summer and occasional heavy waterings during dry weather are well repaid in vigorous growth and profusion of blossoms.

The showy clematises, as represented in the patens, lanuginosa and jackmanni sets, are worthy of the choices places in our gardens, up the pillars of the veranda, on the door posts, around our windows, on pillars or trellises specially prepared for them, or wherever else a pretty vine may be desirable. And the jackmanni set are often used as bedding plants by being planted thickly in beds, and the vines spread thickly over the ground and pegged closely to it. They are propagated by layers of the vines, cuttings, grafting or root-cuttings, division of the clumps, and by seeds; but, most frequently, by layers and division, except in the case of florists, who have come to use cuttings mostly.

But, apart from the clematis as a vine, we know it intimately as a common hardy herbaceous perennial garden plant, in C. recta, for instance. This, the upright Virgin's Bower, a native of Europe, grows three to six feet high, and bears large masses of white flowers in June. There are several forms of it; the double is one of the whitest. Integrifolia is a small bluish-purple one; tubflora, a handsomer

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plant, with small bell-shaped, blue flowers, and davidiana, from Northern China, which has terminal and axillary masses of hyacinth-like blue, sweetly fragrant flowers. It is quite hardy, and one of the finest summer-blooming perennials.—Wm. Falconer in *Rural New Yorker.*

The complaints of a nurseryman in the *Gardeners' Monthly* for January, of having many unprofitable questions put to him, and which he can ill afford time to answer reminds me that I frequently find myself sailing in the same kind of ship by having numerous questions asked and inquiries made, both verbal and written, about the Clematis. It has occurred to me that it might be advisable, if acceptable to you, to offer a few remarks concerning the Clematis, through the columns of your very excellent *Gardeners' Monthly.* In so doing I trust it may be remembered that the following remarks are not intended for the edification of gardeners or nurserymen, or any of the profession, who, in all probability, know the subject much better than I do.

But inasmuch as the Clematis is becoming very popular and deservedly gaining favor every day; and, as the professionals say or write very little upon the subject in the periodicals of the day, so far as I have seen, I will endeavor to answer the querist as best I can, and he must take the reply for what it is worth. There appears to be a lack of general information upon the subject, and the inquiries are as numerous about the old as the new varieties.

According to the books, the word Clematis is derived from the Greek word *klema,* meaning a vine branch, because most of the species climb like a vine.

The Clematis belongs to a very extensive genus of mostly hard-wooded, climbing, ornamental, flowering, shrubby plants, which, one species or other, is indigenous to almost every quarter of the globe. I once heard a lady exclaim to another, while admiring a beautiful henryi: "Oh! what a

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beautiful flower; what a lovely Clematis! Where do Clematises come from?" The reply was: "Oh — oh — they come — they come — they come from all over." How much "all over" was intended to imply I cannot say. But truly, sir, they come from all over. They are almost cosmopolitan. They are here, and they are there, and they are everywhere. Yet many people seem to think there are very few varieties in existence, and these few are considered comparatively new. Whereas there are from 250 to 300 varieties and species in regular cultivation, and of this number, perhaps 250 are what are called large-flowered hybrid garden varieties. Some of the species have been in cultivation over three hundred years, and are still quite popular.

Jackman says: "The scientific records give a total of about 230 species. Of these 17 are European; 43 of Indian origin; 9 are Javanese; Persia, 1; 30 of the finest species from China and Japan; 11 from Siberia; Feejee Islands, 2; South America, 24; Central America and the West Indies, 9; North America, 35; African tropical mainland, 14; South Africa, 4; Mascaren Islands and Madagascar, 6; New Holland, 15; New Zealand, 5." Paxton gives a long list of species from about 30 different countries and parts of countries, the names of which are unnecessary to this article and would take too much space.

Their habitat extending over such a wide extent of country, their natural habit, character and constitution, etc., must necessarily differ very considerably.

Some of the species are hardy, non-climbing, soft-wooded herbaceous perennials, as in erecta and its varieties, growing about two feet high, furnished with large corymbs of white, sweet-scented flowers.

Others are soft-wooded and climbing herbaceous perennials, as in coccinea, which, I believe, is comparatively new and a native of Texas. I have not had this long enough to know much about it.

Others again are non-climbing, sub-shrubby and hard-wooded, growing erect one or two feet, as in viticella nana, and others four or five feet, requiring the support of a stake, and being covered with large panicles or umbels of

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sweet-scented white or blue flowers as in cœrulea odorata and its varieties. Other species are tender, evergreen, winter-flowering and require the protection of a conservatory or a hothouse.

But to attempt to describe many of the species would soon take up too much of your valuable space. The first Clematis introduced into England was our old favorite Clematis viticella, from Spain in 1569, in the reign of Queen Elizabeth, who, it is said, was delighted to be called the Virgin Queen, and in compliment to her majesty the Clematis was very appropriately and very prettily called the Virgin's Bower.

In the same year was brought into cultivation the old wayfarer of the English hedgerows, Clematis vitalba, commonly called Traveler's Joy, Virgin's Bower, Welcome Traveler, Old Man's Beard, White Vine, Smoking Cane, Cigar Plant, Pithwine, etc. One might think a plant having all these common names must be of some importance. Then came Clematis flammula, a well-known European species and called sweet-scented Clematis. After this the pretty little crispa, a native of North America and of the viticella type, is now becoming quite fashionable again. Next in importance, Clematis virginiana, which I think is best of the old common white sorts, but which has no distinctive common name, I believe, and often gets confounded with the vitalba under the name of Virgin's Bower. Besides these have been raised hosts of others, of little importance just now, down to about 1835, when was introduced azurea or cœrulea, now called azurea grandiflora or patens. Flower about 5 inches in diameter, eight sepals. Sepals somewhat recurved and reflexed, of a delicate azure blue, hence its name. About the same time was introduced sieboldii, under the name of florida bicolor. Flower about 3 inches across, sepals standing straight out from the disc, flat and broad, and the center filled with a rosette of purple petaloid stamens, forming a very pretty flower. Sepals creamy white. From Japan by Dr. Siebold.

About 1851, was sent to London from China, I think, by Mr. Forsyth, the grand old lanuginosa. Flowers, 6 to 8 inches across; eight sepals, pale lavender. About 1863, was

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sent from Japan, by Mr. Robert Fortune to Messrs. Standish & Noble, of London, I believe, that fine old double white Clematis named fortunei. Its color is creamy white, sweet scented, 4 to 5 inches diameter. About the same time came standishii; color, bluish mauve. Also John Gould Veitch, a beautiful double blue or lavender blue; both by Mr. Fortune from Japan. From these last named sorts, viz.: patens, lanuginosa, fortunei, standishii and viticella, have been derived these magnificent hybrid varieties which we have now in cultivation.

So far as my experience goes, I think the Clematis is a good thing which is destined to become as deservedly universally popular, for out-door garden culture, as the rose; and for indoors, too, for that matter. For the greenhouse, the conservatory, the parlor window, to cover rock-work or rustic arbors, or any lattice work, pillars of the veranda or porch, or any other ornamental use where flowers are desirable.

For individual specimens, trained to ornamental forms or designs on the lawn, or making good pot specimens to place about the lawn, they cannot be equalled by any other plant for this purpose or climate. For permanently bedding out in the flower beds the Clematis is superior to any other individual class or species of bedding-out plant with which I am familiar. The colors are all that can be desired, and withal, it is the cheapest bedding-out flowering plant we have, for so good a thing.

Three or four dollars do not go far, even at the low price of a dollar a dozen, for bedding-out plants, to fill a bed prettily. The same sum would nearly fill the same bed with Clematises the first summer, and certainly the second, with good plants to start with; for one good strong plant of Clematis will cover the space of a dozen of the others. The tender bedding plants usually die and have to be renewed every year; but the Clematis when established, is "there," and better the second than the first year. The older the plant the younger and fresher it appears. The Clematis is well adapted to our soil and climate. It will grow where any other plant will grow and thrive, save and except under water, just in pro-

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portion to the treatment it receives. It is not at all fastidious as to soil or treatment, yet no plant is more grateful or will respond more quickly to kind and generous culture. The Clematis likes best a deep, moderately light, but rich sandy loam, well drained. After a plant has become four or five years established it will make a growth of 4 or 5 to 8 or 10 feet in height in a season, according as the plant is of a weaker or stronger habit of growth; and, if carefully trained, will cover as much space in width. Many of the varieties of the jackmanni and viticella types will throw their large umbels of flowers so far above their foliage as to present one complete mass of flowers, with scarcely room for a green leaf to appear. These large umbels or panicles of flowers are made up of six to ten individual flowers, each 4 to 6 inches in diameter, usually four to six sepals of, for the most part in these types, the deepest and richest velvety purple to almost black. These types commence flowering the forepart of July and continue on till the frost kills their foliage in October or November. The different groups give us about all the colors that can be desired, from the purest white to almost black, from azure-blue to yellow, and from green to scarlet. It is true we could wish the yellow and the scarlet could be improved in size. They are single, semi-double, rosettes and double; sweet scented and not scented. I have had them in flower from 2 inches high to 10 feet high; and also in size from 2 inches to 10 inches in diameter. I have had Jeanne d' Arc measure a full 10 inches across and lawsoniana 9½ inches in diameter of flower. Eight to 9½ inches are quite common in many varieties, when well grown; and size appears to be now the prevailing fashion. The flowers held in perfection from twelve to twenty days, usually fifteen to eighteen.

I have said they are hardy. They are, and almost as persistent as a root of rhubarb, and should their tops become winter killed, from very extreme weather, they will start up in the spring like a shoot of asparagus. I have compared them to the rose. They are as beautiful in color and as sweet in perfume. But, unlike our beautiful tea roses, which shrink and wither in the scorching hot sun and have to be taken

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up and coddled through the winter, the Clematis will glory in the summer's heat and scarcely wince at the winter's cold.

Hardy as they are, however, no plant will be more benefited by, or more grateful for, a little winter protection with a little littery manure or something of that kind. What varieties would I recommend for general planting? That is a rather difficult matter to decide, and must depend on the purpose for which they are wanted and on the fancy of the cultivator. The family is divided into sections or groups, not botanically, however, but for the convenience of gardeners and amateur planters.

The Montana Group—are strong growers and will flower in abundance from January to May on the old ripened wood of the previous year's growth; the flowers are only medium in size and in clusters, and excellent for cut flowers; but, of course, in order to do this they require the protection of a cool greenhouse.

The Patens Group—give us the earliest large-flowered climbers; flowers singly, from the ripened wood of the previous year's growth; mostly light-colored flowers; May and June out of doors.

The Florida Group.—Large flowers from the ripened wood of the previous year's growth; but making a longer growth than the patens before flowering, and consequently flowering later; June and July. As grown now, mostly double flowers and often sweet-scented.

Graveolens Group.—Mostly rampant climbers, small flowers, often in large panicles; July to September.

Lanuginosa Group.—Large flowers, six to eight sepals; 6 to 9½ inches diameter; climbing; blooming successionally summer and autumn. Flowers on short lateral summer shoots, dispersed and continuous. This group is divided into early and late bloomers; June to October.

Viticella Group.—Mostly large-flowered climbers; blooming in continuous masses on long summer shoots; July to October.

The Jackmanni Group—are large-flowered climbers; blooming successionally in summer and autumn, in contin-

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uous masses. This group make a long and strong summer growth before flowering, hence a little later in coming into bloom. They are divided into early and late bloomers. They begin flowering about the first of July and continue until the frosts kill their foliage and flowers in October or November. A slight frost does not hurt them. They will bear about as much frost as a grapevine.

Cœrulea odorata Group.— Non-climbing; sub-shrubby; flowering on summer shoots; July to September.

Erecta Group.— Non-climbing; herbaceous; flowering June to September.

These two latter groups are not very fashionable in this country, so far as I have seen, though a few have been grown for many years.

I will endeavor to name a few kinds from two or three of the principal groups; but, of course, a full description can not be given for want of space.

Patens Group.— Albert Victor, deep lavender; Fair Rosamond, bluish-white; Lord Gifford, rosy lilac; Lady Londesborough, silver-gray; Miss Bateman, pure white; Mrs. Quilter, white.

Florida Group.— Aurora, semi-double, pinkish-lilac; Countess of Lovelace, double, bluish-lilac; Duchess of Edinburgh, double, pure white; John Gould Veitch, double, lavender blue; Lucy Lemoine, double, white; Venus Victrix, double, pale-mauve.

Lanuginosa Group.—Alba magna, finest white; Angelina, pale, bluish-mauve; Blue Gem, pale cœrulean-blue; William Kennett, bluish-lavender; Duchess of Teck, white; Fairy Queen, pale flesh color; Henryi, beautiful creamy white: Lawsoniana, rosy-purple.

Viticella Group.— Lady Bovill, soft grayish-blue; Madam Grange, maroon crimson; Mrs. James Bateman, reddish-lilac; Viticella rubra grandiflora, claret crimson; Viticella venosa, reddish-purple.

Jackmanni Group.— Prince of Wales, deep puce-purple: Alexandra, reddish-violet; Gipsy Queen, dark velvety purple; Guiding Star, claret-crimson; Jackmanni, intense violet-

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purple; Rubella, deep velvety claret-purple.— Josiah Saltern in *Gardeners' Monthly.*

PROPAGATING THE CLEMATIS.

The best way to propagate the varieties of hybrid clematis, and obtain strong plants, is by layers. The plants are set in rich soil, and as the stems grow they are pegged down and covered at the joints with soil. They soon root, and give strong plants in two years. They must not be cut off from the main plant till the second year. Some varieties as C. jackmanni, grow with comparative ease from cuttings made in summer from new growth. In one instance, a cutting made in July, and planted out the following spring, gave one hundred and seventy blossoms.—G. C. Woolson, in *Country Gentleman.*

TREES AND CLIMBERS.

Mr. Andrew Sherwood is confident that combinations of trees and ornamental vines will constitute in course of time one of the glories of American gardening. He cites in the *Rural New Yorker,* some illustrative examples — first of an old peach covered with roses, worth going a long way to see.

"A climbing rose (the well-known Prairie Queen), had been planted at the root of the tree some ten years ago, receiving no more attention except an occasional bucket of soapsuds and an annual application of soot. But under the sheltering arms of the old peach it has flourished amazingly, until its branches are no less than twenty or thirty feet in length. It was a mass of inflorescence when I saw it, containing not less than a thousand full-blown roses and far surpassing any similar display I have ever seen. The lady of the house informed me that for several years it had not failed to present the same gorgeous appearance with each recurring June."

But why not introduce the element of winter shelter and brightness by using evergreens as su pport and background

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not only for roses, but for other climbers notable for blossoms, foliage or berries? In reference to this point the observing writer calls up other recollections:

"One of the finest sights I have ever seen was a hemlock tree by the roadside in New England, covered all over with a most luxuriant vine of the common bitter-sweet, whose scarlet-and-orange berries contrasted finely with the green of the hemlock. Neither have I forgotten another evergreen — a balsam fir — by a roadside in the Empire state, which was beautifully festooned with the common Virginia creeper. In this case the autumn tints, crimson and fiery red, blended with the green, or rather the steely-blue of the balsam, presented a scene not only rich but indescribably beautiful."

We quote one other instance of nature's own work in this admirable way:

"I know, too, an elm by a river in the Keystone state, whose hirsute arms are hung with this drapery of Virginia creeper in a most remarkable manner. Every branch, both great and small, is wreathed and twined in a way which the hand of man can at best only imitate but never equal. In the early days of October, when the leaves have changed to crimson and scarlet, I must say I have never seen another elm to compare with it."

ORNAMENTAL PLANTING.

Begin by placing the dwelling house eight or ten rods from the highway, with the barn still further back, and a little to one side, rather than across the road in front of the parlor windows. The vegetable and fruit gardens should be in the rear of the house and near the kitchen and barn. If you can not afford to devote much time or money at first to ornamental planting, be careful to start right and make no mistakes. Every stroke should count, and without experience and good advice your labor will be half wasted. About one-tenth of the cost of buildings should be set down for improving the grounds. It would be better to employ a person of skill to aid you, but if this is impossible, read the

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works of Downing and Frank Scott, and begin to study trees at all seasons of the year.

HAVE A PLACE,

once for all, in your head at least, or, better, on paper, and work to it persistently. Do little grading. Downing says: "We see all ignorant persons who set about embellishing pleasure grounds, commence leveling the surface. This is a fearful fallacy to eye and purse." Better emphasize inequalities by planting tall trees on the higher portions of large grounds, leaving the hollows unplanted. Provide for no more paths or drives than are needed for daily use. Guard against attempting too much in any direction. Too many trees, too much shrubbery, too many flower-beds, walks and roads — this is the common error.

A GOOD LAWN

is the essential element about which the other graces cluster. For this rich soil, moisture and fine grass are needed. Do not divide or clutter up the lawn with too many trees, shrubs or flowers. Be sure to leave in planting several open spaces through the entire extent, so that from the porch or windows, as well as from points without, there will be an unobstructed view over the turf. This will give an appearance of spaciousness which cannot otherwise be attained. Plant, according to the size of the ground, small trees and shrubs in small places. One Norway spruce or large cherry tree is often the ruin of a small yard. As a general rule, plant the large trees on the outside lines, with the smaller trees or shrubs nearer the house, or the lawn's center. Plant no large trees within from forty to sixty feet of the house. Such trees shut out the pleasant sunlight, scatter leaves on the roof, rot the shingles, spoil the water in the cistern, kill the grass, keep the walls and paths damp and shut out pleasing prospects. They may not be out of place when small but after they have grown the owner has become attached to them and hesitates to take them out.

TREES IN THEIR PROPER PLACES

shelter the dwelling and barns from piercing winds; they

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add comfort and joy to man and beast; they economize the food of animals and save fuel in the sitting room; they harbor birds; they afford shade in summer; they are the glory of home grounds, and will serve for generations to remind those who enjoy them of the thoughtful and generous hand which planted them. They should not be set in straight rows or at equal distances. Even as a shelter belt on the exposed side of a house they are better arranged in groups which "break joints." Near the projecting points of this irregular line of foliage is a good place for single trees, like islands near a cape, leaving open bays of turf to flow between them into the deeper and more sheltered recesses. Avoid formality. Even in roadside planting, a row of trees will be marred sooner or later by vacancies or unequal growth. Finer effects are produced by planting irregular, mixed groups at salient points. Plant so as to conceal from the best points of house and grounds unsightly objects near or remote. Plant trees or shrub groups on the concave side of sharp turns in walks or drives, and in the angles where paths or roads diverge.

EVERGREENS

are more monotonous than deciduous trees, yet they are green when other trees look dead. Their cones and young spring growth add some variety. In winter they are darker, the bright color returning with the warmth of the early year. In autumn they shed the leaves which grew one or two or more years before. They are particularly charming when snow, which loads their limbs, is seen in contrast with their dark green leaves. A deciduous tree belongs to a higher type, and presents a greater variety of aspect—without leaves, with young leaves, with full grown leaves and with brilliantly colored leaves of autumn. The bark is smooth or rough, the twigs are few or many, the spray scatters into infinite diversity of form and color; the leaves vary in size, shape, color, direction—while in general form no two are alike, and the masses of foliage break into light and shadow in a distinctive way for each species, and almost for every individual. Some evergreens should be used, and more where there are few or none in the surrounding forests.

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Too many will make a place gloomy and sombre — too few will leave it with a cold and naked look in winter.

SELECTION AND CARE.

Choose nursery-grown trees, especially evergreens, which have been transplanted. They will have more roots and are more certain to make a vigorous growth. Do not select large trees, even at low prices. Avoid high-priced novelties until you have experience. Do not try too many kinds, nor more than can attain good development on your place. It is allowable to plant thickly at first for immediate effect, but if so, arrange for thinning out at the beginning, and remove remorselessly before the trees crowd each other. Select trees easily grown and of such species as have been proved thrifty in the region where you live. Do not choose short-lived trees, nor trees subject to the borer, like the mountain ash, nor liable to die in the lower limbs, like the balsam fir. After planting, give the best of care by cultivation, fertilizing and mulching. Do not cut them into grotesque or formal shapes. Look years ahead, and prune with reference to the future. Thinning had better be done a little each year and not a large amount once in five or ten years. Thin before the beauty of your best trees is lost by crowding. Remember that the lower limbs, especially of evergreens, will not start out aright when once removed.

SHRUBS, VINES AND FLOWERS.

These will be used for the final touches of embellishment. Shrubs are valued for their bloom as well as for form and foliage. Each variety will serve some special end. As a rule, plant in irregular groups as directed for trees. At projecting points in shrub masses plant some hardy herbaceous perennials. Use vines for porches or for covering a half dead tree or stump, or rubbish pile. Plant flowers mostly at the side of the house, in irregular but gracefully-shaped beds, and while trees are young, about their trunks, perhaps. No special paths are needed about flower or shrub groups. Rock work is seldom satisfactory, and is only appropriate

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in a retired portion of your grounds. A pile of shells, rocks and scoria in the front yard is badly out of place. Heap them in some back and shady corner, and you will find great delight in transplanting from woods and meadows an assortment of hepaticas, spring beauties, blood-roots, trilliums, bell worts, phloxes and ferns. If you have a pond near by, introduce some water lilies, cat-tail flags, pickerel weed, arrowhead, and near by set some Wisconsin weeping willows and birches and ashes. Do not despise flower, shrub or tree because it is native and "common." As a rule, the best known is better than the imported rarity. Give thought and attention to all the details of the work of making a pleasant home. It is a worthy work. You will be surprised to find how much beauty can be obtained at little cost, and how rapidly everything hastens forward toward the completed plan in your own mind. You will have a constant comfort and a fresh hope realized every year as the trees grow, and transformation follows transformation towards the full development of your original design.—Prof. Beal, in *Trans. Miss. Vall. Hort. Soc.*

STRAWBERRIES.

Experience in strawberry growing is worth a good deal, and sometimes costs all of that. I have never found any kind of soil but with good common-sense cultivation would produce a good crop of strawberries. What I call a good crop is 100 bushels to the acre. We often grow twice and sometimes, when everything is favorable, four times that, and I know of three private gardens where each owner picked from 5 bushels to 6½ bushels from a square rod of ground in one season. I know of one man who from 5 plants of Crescent grew in one year a bed that the next year produced 4 bushels of nice fruit. I have raised at the rate of 270 bushels per acre of choice strawberries on ordinary prairie soil that had been worked twenty-five years without manure. Now, what is wanted is, first, a plat of ground as free frem weeds as possible, rich enough to produce a good

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crop of corn, and rolling enough so the water will not stand upon it.

If you want to grow ten bushels, or more, have the plat long enough to cultivate with a horse; plow and pulverize thoroughly, as early in spring as the ground will work well. No matter whether it is sand or clay, if it will produce good corn, although for clay soil I should recommend somewhat different varieties than for sand. If you are raising many chickens, it may be necessary to enclose the bed with a lath fence, or choose a spot remote from the house or barn. Before you get your ground ready be sure where you are to get your plants; order of some reliable dealer; you can get plants at $1 for 100 of the best tried varieties.

Now don't take plants from an old bed, whether from your own or as a gift from a neighbor, unless you know they are unmixed; pistillate varieties far outrun all others, and it is not safe to plant from a mixed bed. Have your plants arrive just as your ground is ready, and set them immediately. I have received choice high-priced plants at evening, and have planted them by lantern light rather than keep them over night. Set the plants in rows 3 or 4 feet by 1, if for horse cultivation; if for hand cultivation, 2 by 2 feet. Place so the crown of the plant will be just at the surface of the ground, not above and not below. Hoe them every week as long as weeds grow; if you can afford to cut the runners you will get larger fruit, and about the same quantity as in matted rows. If you let them bear, the year of planting, it will detract from the size of the plants and bed for the next year; it is best to cut off all blossoms as they appear.

In autumn when the ground freezes up to stay, or so it will bear a loaded team, cover the bed all over, just so you can not see the foliage, with dry leaves, marsh hay, the refuse from the sorghum mill, cut stalks, or anything that has no foul seed in it. In the spring leave this all on; if the plants can not push through, open a little. Some remove the mulch and cultivate and replace, but after thirty years' experience, I find the less the mulch and ground are disturbed until after the crop is harvested, the better the fruit

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and the more of it. Now about kinds. Because Crescent is the most productive of all, don't plant all Crescent, for it is pistillate, and an acre of them would be useless. The great cause of so many failures is all pistillate plants, and these usually abound in an old bed. Set two rows of one kind and two of another, being sure that every other two rows are perfect in the blossom, then you will have no failure. Crescent is the most productive, Longfellow the most profitable large berry, Countess wonderfully productive, and I have the record of one person who picked of this kind 239 quarts in one day; Wilson is one of the best for shipping and canning, Capt. Jack, Miner's Great Prolific, Vick and Piper are all good and can all be had at $1 per 100, and only Crescent in this list is pistillate. After the first crop let the bed remain as long as it pays, but set a new bed every year, let it be ever so small—Geo. J. Kellogg, in *Prairie Farmer*.

STRAWBERRIES OF THE NORTH.

I am of the opinion that the strawberry will grow nearer the north pole than most of our cultivated fruits. It will succeed far north of the corn-growing belt. I have seen it succeed where the frosts that enter the wall during the winter often remained all summer. It will be interesting to know how far north the strawberry will succeed. Its being capable of being protected gives it an advantage over other fruit. It is quite a consolation for those living far north to know that while they may be deprived of many valuable fruits, they may indulge in the delicious strawberry grown in their own gardens.

One serious drawback to strawberry culture in the north is the effect of late spring frosts, but I doubt whether strawberries at the north are more seriously, or oftener injured by late frosts than at the south. As the strawberry blossoms so early, it is always more or less in danger from this source. When we stop to think of it, the strawberry is really a phenomenon. Its ripening in such a brief space of time is nothing less than marvelous. What other fruit or vegetable have we when the strawberry ripens? At its approach the

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growing season has just commenced, and the harvest of most products is far in the distance.

I have a low muck lot on which we have planted strawberries successively for many years. This lot has never escaped the frost entirely until this year, and still we have always gathered a fair crop of berries there. I am not discouraged in growing them on this piece of ground, as the plants increase there rapidly, and plants are my object more than fruit.

For a distance of six or eight miles from the great lakes frosts are hardly ever known to do any damage in the spring, the influence of the lakes being such as to prevent heavy freezing. This kind of protection by bodies of water should be considered by every person locating a fruit farm. Such protection is desirable not only for strawberries, but equally so for grapes, pears and apples.

The strawberry at the north has fewer insect enemies than the strawberry of the south, the white grub being the most troublesome and that only appearing at long intervals. For seven years we escaped the white grub, almost entirely, but last year it appeared in strong force and did us much injury. There is no remedy for it that I am familiar with. We have attempted to dig it out and destroy it, but have doubts about its being a paying enterprise.

Hill culture of strawberries is not as desirable at the north as at the south, for the reason that they are more liable to be heaved by frost in the winter. On some soils it is easy to protect them by mulching, but on others it is very difficult; but in matted rows the foliage protects them better than mulching. In fact strawberry growers at the north do not design to cover the plant with mulch, but simply cover the space between the rows. We prepare the soil for strawberries the season in advance of planting, by plowing under a good dressing of yard manure and thoroughly subduing the weeds by cultivation with a good cultivator. When winter approaches, we ridge the land to let off the surplus water in early spring and give free action to the frost. An excellent fertilizer for the strawberry is the hoe and horse cultivator. Indeed so beneficial are the results

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of these implements on ordinary corn or wheat soil, that strawberries may be grown successfully without the aid of any other fertilizer. Bone dust and ashes are considered the special fertilizers for the strawberry. The good resulting from yard manure applied in the coarsest condition, is largely owing to the mechanical condition which it gives to the soil by decaying after it is plowed under. If the soil is very tenacious we sometimes plow under a crop of fodder corn sown broadcast, after the same is two or three feet high; or a crop of buckwheat, or anything of that nature. Irrigation at the north is not so essential for the strawberry as some have supposed, although it would be exceedingly desirable in all cases. It is, however, an expensive operation, and should be undertaken with great caution. The strawberry lacks quality after irrigation, and is liable to be soft. Few are aware of the quantity of water required to irrigate an acre of land artificially. It requires experience to irrigate, and a novice will find that he has much to learn before he can succeed in irrigation.—Chas. A. Green, in *Rural New Yorker.*

SEEDLINGS.

Strawberries and raspberries are easily raised from seed by any one so inclined, and the young people may like the experiment. Crush ripe berries and mix the seed with sand. Sow this mixture about a quarter of an inch deep, cover with light soil and tread on the drill. Keep moist constantly and by fall some plants will have appeared, which, being planted out properly, will show a little fruit the first season, and give a crop the year after. It would be a grand thing to raise a new seedling that would excel any we have, and one day it will be done.— *Green's Fruit Grower.*

On the Earle fruit farm in southern Illinois, where are forty-five acres of strawberries, Crescent is voted as the most profitable for market. Mr. M. B. Wilson, of the same region, who lately picked from eighty acres prefers "Crescent fertilized with Wilson." This is his present opinion after twenty years of careful experimenting.— *Tribune.*

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RASPBERRY CULTURE.

WHAT I KNOW ABOUT RASPBERRY GROWING.

Raspberries are attracting more attention at this particular time than ever before. Raspberries have always been appreciated more or less on account of filling in the place nicely between strawberries and blackberries. It is a fruit much admired by many, though never so popular as the strawberry. Up to within a few years there were but few varieties. The Red Antwerp, American, or common Black Cap, and Brinkle's Orange, were popular as far back as I can recollect. As much improvement has been made in late years in the raspberry as in any other fruit; we are now not confined to three or four varieties, but varieties of distinguished merit can be counted by the dozens. I have grown the raspberry for market now twenty-six years, but never to the same extent as at present. I now plant largely of them because I find their culture profitable. Any of you can do as well if you have suitable soil and varieties, and understand the proper mode of culture.

THE CONDITION OF SUCCESS.

To grow raspberries successfully you must select good soil, well underdrained; let it be clay loam or sandy soil, but prefer upland clay loam. I have known them to do admirably in almost any soil, provided it is rich and not wet. Plow as you would for any other crop; the deeper the better if your soil admits of it. Harrow well; plow out furrows six or seven feet apart and plant in said rows three feet apart — a partial shade I find to advantage. My patches that do best are in an old orchard.

BLACK RASPBERRIES

are usually planted shallow, an inch or two deep. If it is your intention to tie up your canes, that is deep enough, but if you wish them self-supporting you must plant them so that by after-culture they will be at least three to four inches

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deep, otherwise they will not be self-supporting. By so planting, and pinching back, as hereafter described, I never have trouble about my canes blowing or falling down by the weight of fruit.

The first year's growth I pinch back when eight to ten inches long. The second year, and every year thereafter, I pinch back the tips of the growing shoots when from twenty inches to two feet high. They then cease to grow in height, but throw out laterals in all directions, balancing and supporting the main stem effectually. The following spring, early in the season, I cut back all laterals with hand-pruning shears, leaving them from one foot to two feet long, according to the number and strength of canes in the hill. This operation is quickly done and inexpensive. After pruning, I gather and carry out and burn all the débris between the rows. I then cultivate, first with a double shovel or bar-shear plow, then in time with a cultivator, as often as it is necessary to keep them clean, free from grass and weeds, up to August, after which I let them rest. It is not a good plan to cultivate too late in the season; you thereby cause them to grow too late to mature the wood sufficiently to withstand the cold of winter. I plow and cultivate them three to four inches deep. You need have no fear of injuring the roots by so cultivating.

RED RASPERRIES.

I plant the same distance as black, three by six feet. This takes 2,420 plants to the acre. I do not cut back the canes of red varieties (as I do the black) until the following spring, except strong growing varieties like the Turner, Conover, Colossal and others of like character. These I cut back during the season of growth, when about three feet high, otherwise they may grow to seven or eight feet, as I have seen them grow, necessitating the cutting away of too much wood in the spring. Treat suckers between the rows as you would weeds, unless you want plants; cut them out when young and tender. Sprouts, or suckers, are a great annoyance in growing red raspberries. If taken in time they need scarce any care. Red raspberries, to do their best, must be

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kept in hills, the same as black. This can be done by cutting away with a sharp hoe all sprouts, when young, between the hills in the rows, allowing from four to eight canes to the hill. Many growers allow them to grow all along the rows, though not too thick.

OLD CANES.

There is a difference of opinion among raspberry growers as to the best time to cut away the old or bearing canes. I have tried both methods, namely, letting the old canes remain all winter and cutting them in spring, or cutting them as soon as I can find time after fruiting, carrying out and burning them. I am satisfied, by adopting the latter method, I destroy many noxious insects, worms in various stages of life that would live over winter, were I to practice the other system. It is argued that the leaf of the old cane has much to do in the growth of the canes that are to bear fruit the following season. I take no stock in that opinion. If your plants are in good condition there will be leaf enough on the young canes to mature them without the assistance of the leaf of the old canes that have already performed their functions by maturing the crop of berries just gathered. Then, again, the old canes are certainly not ornamental. Having an eye for the beautiful as well as the useful, I get rid of them as soon as I can after the fruit has been gathered.

TYING UP CANES.

For a long time I advocated and practiced the tying up of canes, first to stakes, then to an iron wire stretched along the rows, fastened to posts every twenty-five to thirty feet. Either of the systems I found expensive and slow work. It did well enough when I had but an acre or two, and did not know any better. But when I had many acres I found it was not the thing to do, especially so when I learned that stakes and wire were of no use, I might say entirely unnecessary. I can not help but sympathize with those who are so far behind the times as to follow that system now. By adopting the pinching back process, at the proper time, I

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save the expense of stakes, or posts and wire, and the time necessary to tie the canes to them, and raise as many bushels of as nice berries per acre as I did when I followed the old system.

GATHERING BERRIES.

I have often been asked how I manage the many hands necessary to pick my berries, so as to have the job well done, and to have them continue to the end. First, I live near a large city, Dayton Ohio, (too near to save a large part of my apples and pears), and can get all the pickers I need, and my system is as follows: I use a stand with handle holding four quart-baskets to pick into. Each picker is given a stand and a basket-holder, which holds one quart basket. This holder is tied around the waist, enabling the women, girls and boys to use both hands in picking. Thus equipped, they are put two to a row, one on each side. I have a trusty man to be with them continually; his business is, first to see that they pick none but ripe fruit; second, that they pick all that is ripe; third, that they do not damage the berries nor canes; fourth, that they do not skip rows or parts of rows; fifth, that there is no wrestling in the patch. When the stand has four full quarts, they are brought out to where the packing is done, in the shade of one or more trees. Then give them a check for the full stand, and an empty stand filled with baskets to fill again, and so on till the day is over. I have large printed checks good for ten, twenty and thirty checks, which I give in exchange for smaller checks when desired. I pay no one money on account, or in full, until the last picking is over, except in case of sickness or, for other good cause. By adopting this method my hands continue their work until the last picking is over. When pay day comes all are made aware of it, all come, and when we are through with the last picking, all hands collect in the shade and are paid off in full, after which I give them a treat of cider, lemonade and cakes; all have a good time and go away more happy than many worth their millions.

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PACKING AND MARKETING.

There is a very strong disposition about Cincinnati, and where I live, to stick to the old half-bushel drawer (four drawers to the stand), for such berries as will stand shipping well; of course I comply with the wishes of those who buy my berries, *whilst I may not agree with them.* I therefore empty the berries from the quart baskets into which they were picked into the drawers, sixteen quarts to the drawer, put the drawers up in stands, and deliver them at the business places of the parties who buy the crop. Red raspberries are put up in pint baskets, and so shipped. Such varieties as Thwack, Brandywine and Cuthbert can be put in quart baskets, and will so carry to market in good condition. It has been my good luck since I have been in the business to sell all my berries to responsible shippers at home—Dayton. They do the shipping, run all risks, furnish the stands and charge me ten per cent. on sales. I do not retail, get satisfactory prices, and run no risks. One or two parties usually handle all my berries.

VARIETIES TO PLANT.

Of varieties I will say but little, except to advise those who desire to go into the business to make money, to confine themselves to but few varieties; two or three each of black and red, early and late, are all that are necessary.—N. Ohmer, in *Trans. Miss. Vall. Hort. Soc.*

Mr. N. Ohmer, of Ohio, has eighteen acres in raspberries, nearly all of the Gregg variety. Part of the plantation is shared by pear trees, the two fruits growing together without seeming detriment to either.— *Tribune.*

A model hill of raspberries, after being trimmed in spring, should have but three or four canes about three and a half feet high and nearly one inch in diameter at the base, each cane having a few side spurs about ten inches long.—*Farmer.*

Mr. Robert Johnston, while thinking that six or seven feet apart is wide enough for the other raspberry and black-

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berry rows, finds great advantage in leaving eight feet for every fifth space, to admit a wagon, from which manure may be thrown both ways to reach all the plants.—*Tribune.*

NOTES ON GRAPES.

[The following notes on old and new varieties, contributed by William C. Barry to the *Country Gentleman* for January 15–22, 1885, contain answers to so many questions propounded by people desirous of knowing something about the varieties they are advised to set, that they are well deserving of space in this volume. Those recommended in the Society's fruit-list are marked with a star.]

The introduction of many new varieties of grapes, of reputed excellence, during the last few years, has given a fresh impetus to grape culture, and planters, generally, are watching with considerable interest the reports concerning them which are now beginning to be made in different sections of the country.

Soil, climate and locality exert so great an influence upon the grape, that actual experiment alone can determine how a new sort will succeed outside of the place where it originated; hence, we have to depend mainly upon the reports of cultivators in different localities.

The writer proposes to give briefly, the result of his observations the past season and hopes that others will furnish similar information.

Sufficient time has now elapsed to give many of the newer grapes mentioned a fair trial, and in most cases we can regard the conclusions arrived at as nearly correct, although not by any means final.

The season here (Rochester, N. Y.), as a whole, was quite favorable for the grape, although the early part of the summer was cool and wet, and generally unfavorable; but in August and September a succession of warm days and nights brought the fruit rapidly toward maturity. It is believed, therefore, that all the varieties ripened which would do so in an average season. The vineyard where the

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observations were made, is favorably situated on one of the hills near the city of Rochester. It has a southern aspect and is protected on the north and west with belts of evergreens. The soil is a deep, gravelly loam, varying to a sandy loam with a gravelly subsoil. The vines of the newer sorts are all quite young as yet and will no doubt give better results when they become older. In some cases our observations were made and conclusions reached from a single plant, which cannot always be regarded as a fair or safe criterion.

The season here is not considered a long one, for the Catawba rarely ripens perfectly. The country around is noted for its freedom from great extremes of cold or heat, as well as from late spring or early autumn frosts, the waters of Lake Ontario, which is only seven miles distant, tempering the atmosphere. I mention these circumstances so that due allowance may be made for the opinions advanced.

It is to be hoped that several kinds from which much was expected and which disappoint us now, may, on longer trial, prove deserving. From the remarks made, it will be noticed that several sorts which otherwise have admirable qualities are apparently of little value here because they fail to ripen. Further south these varieties will no doubt ripen and be of much esteem.

We will now consider the different kinds in their order of ripening, devoting our time mainly to recently introduced sorts.

**Moore's Early*—This variety is a pure native. It ripened September 8th, about the same time as Massasoit, three days after the Hartford, fourteen days after the Champion, two or three days before Lady and Brighton, and about two weeks before the Concord. The bunch is of medium size, moderately compact; berry large to very large, round; color black, with a blue bloom; flesh pulpy and of medium quality, better than Champion, but hardly equal to Concord; vine vigorous and hardy, but so far as we can see, only moderately productive. It is a handsome grape, and will sell well in market, although we think the Champion or Hartford to be more profitable.

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Rochester — Ellwanger and Barry's seedling is also a native, and ripened September 10th. The bunch is large, generally double shouldered, very compact; berry of medium size, dark purple; flesh melting, vinous, sweet, highly perfumed and rich. The vine is vigorous, hardy, with remarkably healthy foliage and bears heavy crops in the worst of seasons, the fruit setting well under the most adverse circumstances. The fruit must be gathered and used as soon as ripe, for if allowed to become too ripe, it drops. Although this grape was introduced several years ago, it is rarely found owing to the difficulty experienced in propagating it. It is referred to here on account of its excellence, either for the garden or vineyard, and we think it deserves to be disseminated, even if its propagation be slow and expensive. One cultivator in Canada goes so far as to say that the originators have not bestowed on it the praise to which it is justly entitled. On further trial over a wider extent of territory it may develop faults which have not been noticed here.

* *Lady* — A white seedling of the Concord. Bunch of medium size, moderately compact; flesh tender and pleasant, but not rich; vine vigorous, hardy and productive. It ripened September 10th, and is a valuable, early, white grape.

Eumelan — Introduced several years ago by Dr. Grant, is almost too old a variety to be mentioned among these grapes, but its fine quality entitles it to consideration as an amateur's grape. Propagators cannot increase it profitably, hence it does not find its way into as many gardens as it should. Bunch of medium size, but variable, sometimes large, often small, somewhat loose; berry of medium size, black, with a thick, blue bloom; flesh juicy, rich and of superior quality; vine moderately vigorous, hardy and yields well. It succeeds best when grafted on a strong grower, and is valuable only for the amateur who desires a fruit of the best quality. It ripened September 11th.

* *Brighton* — A cross of the Concord and Diana Hamburg, is another rather old sort which has done so well this year that it would seem unfair to overlook it. In point of quality

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it is not excelled by any grape grown in the open air, but it must be gathered and eaten as soon as it is ripe, for, when permitted to remain on the vines too long, it loses its flavor. The berry and bunch are large and handsome, and the vine is vigorous and productive. In some situations the foliage mildews, sometimes only slightly, and again seriously; but it generally succeeds in favorable localities under careful culture. Recently it has been planted quite extensively for market, but care should be observed in selecting a suitable location. An amateur's collection which does not include the Brighton would certainly be incomplete. It ripened September 11th, ten days before the Concord and about a week after the Hartford.

Early Victor — Raised by John Burr, is one of the newest grapes and, therefore, not very widely distributed as yet. The bunch is rather small or of medium size and compact. The berry is of medium size, round, black, covered with bloom; flesh slightly pulpy, very sweet and pleasant, but without any vinous spirit, which, to some tastes, is agreeable. It ripened September 13th, five days after Moore's Early, eight days after the Hartford and eighteen days after the Champion, and only ten before the Concord. It was supposed to be earlier than Moore's Early, but it does not prove to be so this season, and it looks as if this sort would not occupy the place destined for it, although it is a good grape in its way.

Amber Queen is a variety in which I have been considerably interested on account of its superior quality, but I doubt whether it is destined to become popular, owing to a serious defect which it has of not setting its fruit well. The bunch and berry are of medium size; color a bronzed purple overspread with bloom; flesh tender, sprightly, vinous and very rich; vine vigorous and productive, with a healthy foliage, but its leaves have a yellowish tint by which plants of this variety may be quickly and surely identified. It ripened September 13th.

Lindley — One of Rogers' red varieties, has done so well in several localities, as to be esteemed one of the best red grapes in cultivation, Like all hybrid grapes, it develops

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faults occasionally, which are often of slight importance, but frequently serious under certain unfavorable circumstances. So far as I know, the greatest defect is that of failing to set a full crop regularly. One of its striking characteristics is its beautiful color, a bright, clear shade of red which attracts the eye to it at once, even when it is surrounded by larger and more showy grapes. Nor is one liable to be disappointed after tasting it. Its good quality renders it a favorite immediately, and the pleasure it gives the palate is not easily forgotten. We regard it as one of the best red grapes in our vineyard, and from what we know of it, we should rank it among the standard sorts for the garden or vineyard. Strange to say, for some cause or another, this variety of the Rogers has not been disseminated to the same extent as some others less worthy. It ripened September 15th, a week before the Concord.

**Duchess* — One of the new white grapes, is said to have been produced by crossing a white Concord seedling with Delaware or Walter. The bunch is medium to large, long, shouldered, very compact, somewhat crowded; berries of medium size, but not uniform, some being quite small; form roundish; skin thick, generally dotted with small black spots about the size of a pin's head; color light green at first, becoming greenish yellow when ripe; fruit almost transparent; flesh tender, without pulp, juicy, sweet, crisp, rich, and in quality it holds the highest place; vine vigorous and productive, and the foliage that I have seen is healthy, though in some places it is said to mildew badly. Grown with care, the Duchess will, no doubt, prove to be a valuable white grape for the amateur, and, perhaps in favorable localities may be cultivated successfully on a larger scale for market. It ripened September 18th, with Rebecca, five days before the Concord.

**Worden*—Is an old variety, the value of which does not seem to have been appreciated until quite recently: hence it is not widely known as yet. For a long time it seems to have been regarded as identical with the Concord, possessing no points of superiority over that sort. This misapprehension, perhaps, arose from the fact that a spurious kind,

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or perchance the Concord itself, had been distributed under the name of Worden. Careful observers, who had the genuine plants, discovered a marked difference between it and the Concord, and claimed for it superiority in several respects over that variety; a decision in which planters generally now acquiesce. It resembles the Concord closely, having all the characteristics of that well known sort, but the berry is larger, a little better in quality, and it ripens a few days earlier. To the casual observer, the points of difference may not seem sufficiently striking, but if a vine of the Worden, loaded with fruit, be compared with the Concord, a marked distinction will be noticed. We have watched the two sorts closely for two or three years, and compared them carefully, and have arrived at the conclusion that the Concord has a most formidable rival, which is destined at no distant day to supplant that old and famous sort. A grape which bids fair to accomplish this result must, indeed, be a remarkable and valuable one, and its acquisition marks an interesting and important era in grape culture in the United States. It ripened September 20th, three days in advance of the Concord.

[With us, it has usually ripened, for several years, about a week or ten days before the Concord.—*Eds. C. G.*]

Vergennes—A chance seedling from Vermont, and introduced only a few years since, has attracted considerable attention on account of its size and keeping qualities. The bunch is of medium size and somewhat loose, not uniform; berries large, round; skin very thick, tough, red, overspread with a thick bloom; flesh quite pulpy, pleasant, but not rich. It is a handsome grape, but its dull color greatly detracts from its beauty. Its chief value lies in its keeping quality. The vine is vigorous, hardy, healthy and productive. It seems to be a variety which will do well with ordinary care, and therefore may be considered promising for market. It ripens at the same time as the Concord, and not with the Hartford, as was expected.

Gaertner—Rogers' No. 14, is another of the Rogers hybrids which is not so well known as it deserves to be. The bunch is large; berry very large, round; skin thick, and of

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a beautiful light red color, with purple bloom; fruit transparent; flesh slightly pulpy, sweet, pleasant, rich. The vine is vigorous, healthy and productive. It is unquestionably the handsomest grape known for open air culture, and merits special attention from fruit growers. It ripened September 23d, or with the Concord.

Niagara—It is believed that in this variety the white grape so long sought after, and the need of which has been so much felt, has in a large degree been supplied. The cluster is large, of good shape, compact; berry large, roundish; skin green, with a whitish bloom, becoming amber colored when fully ripe; flesh slightly pulpy, sweet and pleasant, in quality not quite equal to the Concord. In the first stages of ripening it has a foxy odor, which disappears somewhat as the fruit approaches maturity. The vine, apparently, is as hardy, vigorous and productive as the Concord, and the foliage is thick, leathery, and unusually hardy, resisting the effects of extremes of weather to a degree scarcely equalled in any other sort. The special merits of this new variety may be briefly stated as follows: Large, handsome fruit, which is of medium quality, great vigor, healthfulness and productiveness of vine. Although it cannot be regarded as a perfect grape, its introduction goes a good ways towards supplying a long felt want, and cultivators all over the country will welcome it. From a commercial point of view, it will be looked upon as an important gain, and large amounts of money will be and have already been invested in its propagation and dissemination. It ripens September 23d, with the Concord.

**Prentiss*—Another of the new white grapes which is attracting a good deal of attention just now, is said to be a seedling of the Isabella. The bunch is of medium size, compact; berry medium, round; skin thick, pale yellow when ripe; flesh tender, juicy, sweet and pleasant. It bears considerable resemblance to the Rebecca, but the clusters are more uniform. It ripened October 1st, about ten days after Rebecca and a week after Concord. It seems to be an improvement on Rebecca, except in flavor and time of ripening.

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**Lady Washington* — One of Mr. Ricketts' remarkable hybrid grapes, is a cross of Concord and Allen's Hybrid. Bunch very large, shouldered; berry medium to large; skin green at first, changing to pale yellow when ripe; flesh pulpy but tender, juicy, sweet, not rich; vine remarkably vigorous and productive. This is, indeed, a splendid grape, remarkably showy and of good quality, but the season here does not seem to be quite long enough to enable it to become thoroughly ripe. It did not ripen perfectly this season. No doubt it will be very valuable further south, or even in favored localities here.

**Pocklington* — Still another of the white grapes said to be a seedling of the Concord, and possessing the vigor, health, hardiness and productiveness of its parent. Bunch medium to large, compact; berries large; skin green, tinged with yellow when fully ripe; flesh pulpy, but sweet and pleasant. This is a large, handsome grape, of medium quality, but it will require favorable seasons and good locations to ripen it satisfactorily in this region.

The following grapes I am not able to arrange in the above list. Some did not mature at all, and the date of ripening of others was not recorded. Hence we will take them up without regard to order.

Eldorado — One of Ricketts' seedlings, was obtained by crossing Concord and Allen's Hybrid, that is with the same parentage as Lady Washington. Our plant produced only a small cluster, which was defective in consequence of the fruit not setting well. The berries were of medium size, amber colored, and of good quality, much better than the Lady Washington. It ripened fully ten days in advance of that sort.

Wyoming Red or *Wilmington Red* — Originated at Ithaca, N. Y. It is a strong growing, hardy sort, producing medium sized cluster of red fruit, which is pulpy and foxy and of poor quality. On account of its earliness, vigor and hardiness, it seems to be regarded as desirable for some regions.

Jefferson — A cross between the Concord and Iona, and originated by Mr. Ricketts, is a handsome new grape, which has been watched with great interest by fruit growers, who

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have been expecting that it would prove to be a most desirable accession. It resembles the Iona closely, both in appearance and quality, and relative to the latter qualification, it is difficult to determine which of the two excels. The Iona is more vinous and the Jefferson is richer, having more sugar. The bunch is of medium to large size and shouldered; berries medium to large, roundish; skin thick, light red, with a lilac bloom. It ripened this year after the Iona and with the Catawba; therefore we fear it may be too late for this locality, but sincerely hope that this may not be the case.

Highland—Another of Mr. Ricketts' seedlings, is a hybrid between Concord and Jura Muscat. It is a very large and remarkably handsome black grape, but it will not ripen here, a fact much to be regretted, for it would otherwise be a most important addition.

Burnet—Raised by P. C. Dempsey, of Ontario, is a hybrid between Hartford Prolific and Black Hamburg. Bunch medium size, somewhat loose; berry large, oval, black; flesh without pulp, vinous, rich. It is a fine and distinctly flavored grape, but the foliage frequently suffers from mildew. Under favorable conditions it becomes a fine grape for the amateur.

Naomi—Also one of the Ricketts' seedlings, is a hybrid between Clinton and one of the Muscats. Bunch large, shouldered, compact; berry of medium size, roundish oval, pale green, with a whitish bloom; skin thick, but almost transparent; flesh melting and sprightly, with a marked Muscat flavor. This is a handsome and richly flavored white grape but it does not ripen here in the average seasons.

Uhland—A seedling of the Taylor, and a leading white wine grape at the west, is not of any value here. The skin is very tender and cracks, the flesh is pulpy, what is called meaty, nevertheless tender. It yields very heavy crops and bears regularly, and may, perhaps, be useful as a wine grape in some places in the east.

**Elvira*—Resembles Uhland, but the berry and cluster are not quite so large, and the plant does not yield as heavily.

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Black Eagle — Is a fine table grape, with a rich sprightly vinous flavor. Bunch medium to large, rather loose; berry of medium size, oval; skin black with bloom; flesh slightly pulpy; vine vigorous and a good bearer; foliage healthy.

**Janesville* — Is an early black grape from Wisconsin ripening with the Hartford, but not surpassing it in any respect.

Miner's Seedlings — We have tried them all without finding a single one in the collection which, in our opinion, deserves to be kept. The Victoria is a good, white grape, but is superseded by others.

Rockland Favorite — A black grape from Massachusetts, we do not consider worthy to be retained.

Triumph — The beautiful white grape originated by Geo. W. Campbell, will not ripen here, but it is becoming popular at the south.

The question now naturally suggests itself whether any progress is being made in grape culture. Undoubtedly we are making great progress. If we get only three or four really valuable grapes from among the large number now offered, it will be a great gain, and should be satisfactory.

The originators of these new sorts, who have labored so long and patiently, deserve our sincere thanks. We hope that their efforts will receive such pecuniary reward as will encourage them to prosecute their labors in the future. There is still room for much improvement.

GRAPES FOR THE NOVICE.

PLANTING.

Take your vines in a pail with water, or wrapped in a wet cloth, from the place where they were heeled in to the holes. When planting let one person shorten the roots with a sharp knife, then spread them out evenly on all sides and let another fill in with well pulverized earth. The earth should be worked in among the roots with the fingers, and pressed to them with the foot. Lay the vine in slanting, and let its

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top come out at the stake previously set. Then with the knife, cut back the top to a bud just above, or even with, the surface of the ground. Do not leave more than two buds on any one of the young vines which you are planting, however strong the tops, or however stout or wiry the roots may be. One cane is sufficient to grow, and merely to be prepared for possible accident, both buds are allowed to start. The weaker of the two shoots may afterwards be rubbed off.

When planted in the Fall, raise a small mound around the vine so that the water will drain off, and throw a handful of straw or any other mulch on the top of the mound to protect it; but do not under any circumstances cover the vine with manure, either decomposed or fresh.

During the first summer little else can be done than to keep the ground mellow and loose about the plants and free from weeds; stirring the ground, especially in dry weather, is the best stimulant, and mulching is far better than watering. A fair growth is about four feet the first summer. In the fall, after the foliage is all off, cut back to two or three buds. Cover the short cane left with a few inches of earth before the ground freezes. If any vacancies have occurred, fill out, as soon as possible, with extra-strong vines of the same variety.

TRELLISES.

During the following winter, the trellis should be built. The plan adopted by most of our experienced grape-growers, as possessing some advantages over other plans, especially if grapes are grown in large quantities, is as follows: Posts of some durable timber (Red Ceder is best) are split three inches thick and about seven feet long, so as to be five feet in height after being set; these posts are set in holes two feet deep, sixteen to eighteen feet apart in the rows (so that either two vines eight feet apart, or three vines six feet apart, are between two stakes); three wires are then stretched horizontally between the posts, being fastened to each post with a staple ∩, which is driven in so firmly that the wire is prevented from slipping through. The two end posts should be larger than the others, and braced (Fig. 1), so that the contraction of the wire (in cold weather) will not

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loosen them. The first wire is placed about eighteen inches from the ground, and the others eighteen inches apart; this brings the upper wire about four feet and six inches from the ground. The size of the wire used is No. 10 annealed

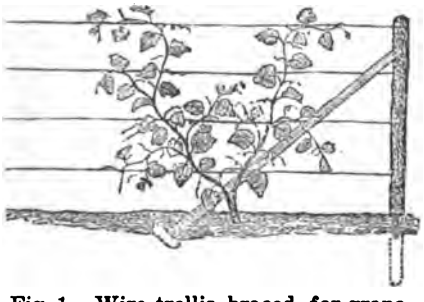

Fig. 1.—Wire trellis, braced, for grape.

iron; No. 12 wire is strong enough. At the present prices of wire the cost per acre will be from $40 to $60, according to distance of rows and number of wires used.

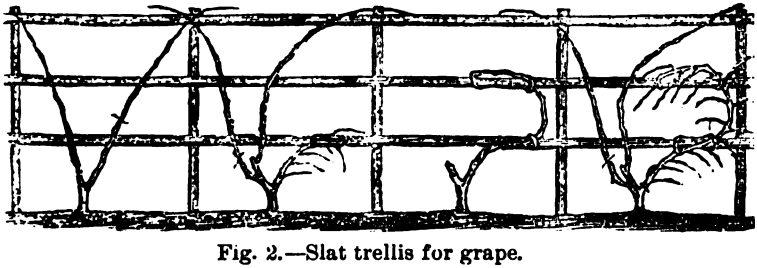

Fig. 2.—Slat trellis for grape.

In place of the wire, slats or laths may serve the same purpose, as shown in figure 2, but they are not durable, and the posts must be put in much closer.

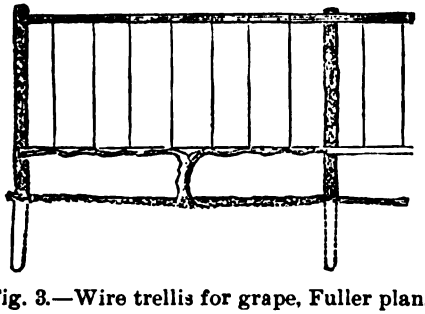

Fig. 3.—Wire trellis for grape, Fuller plan.

Another mode of making wire-trellis (the Fuller plan) is with horizontal bars and perpendicular wires, as shown in

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figure 3. Posts of good, hard durable wood, three inches in diameter, and six and one half to seven feet long, are placed between the vines, at equal distances from each vine, and in a line with them, two feet deep in the ground. When the posts are set, nail on strips about two and one half inches wide and one inch thick, one strip or bar being placed one foot from the ground and the other at the top of the posts. Then take No. 16 galvanized iron wire and put it on perpendicularly, twisting it around the lower and upper bar at a distance of about twelve inches apart. Galvanized wire is preferable, and as a pound of No. 16 wire gives one hundred and two feet, the additional expense is but very small. This trellis will probably cost less than one with horizontal wires, and is preferred by some. Practical experience, however, speaks in favor of horizontal wires, and a method with only two horizontal wires, the lower about three feet high and the upper about five and and one half feet high, is gaining the good opinion of vineyardists East and West.

A good many grape growers train their vines to stakes, believing it to be cheaper. This method has also the great advantage of allowing us to cultivate. plow and cross-plow the ground in all directions, leaving but little to hoe around the vines Some use one stake only, as shown in figure 4, but with our strong growers this mode is apt to crowd foliage and fruit too much; others therefore use two, and, where timber is plentiful, even three stakes around each vine, about ten inches from it, winding the canes around them spirally until they reach the top. The disadvantages of training on stakes are, that these soon rot in the ground, and must be almost annually taken out, repointed and driven into the soil, consequently they require more labor, and are not as durable as a trellis, unless cedar poles are used, or other very durable timber. A very simple combination of the trellis and stake system, shown in figure 5, is also highly recommendable, requiring

Fig. 4.

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but one wire for bearing the canes, and much lighter stakes, which need not be set as deep into the ground as where no wire is used to hold them, and consequently they will last longer; but by this method one cannot cross-plow.

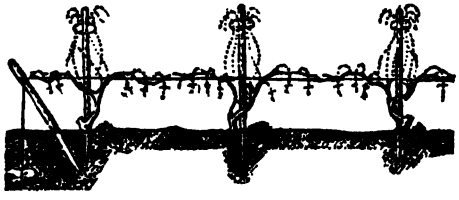

Fig. 5.—Trellis with stake combination for grape.

To secure this advantage, and at the same time to give to our strong growers more space and the benefits of high training, an arbor trellis, such as shown in Fig. 6 may be used. The construction of this is more expensive on account of the necessary high posts (of which the end posts only need be quite strong) and of wire; but the productiveness and exemption from disease are also greater in proportion. By this method the ground might also be used for grass culture, and summer pruning and tying are almost entirely dispensed with. The fruit gathering is, however, less convenient, and none but quite hardy, vigorous varieties should be thus trained.

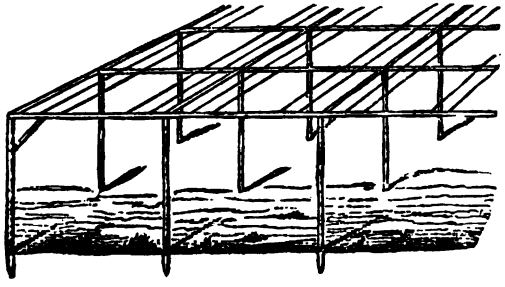

Fig. 6.—Arbor trellis for grape.

If you covered your young vines last fall, remove the earth from over them at the approach of spring, as soon as danger from frost is past; then cultivate the whole ground, plowing between the rows from four to six inches deep, and carefully hoeing about the vines with the two-pronged Ger-

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man hoe or *Karst*, or Hexamer's pronged hoe. The ground should thus be broken up, inverted, and kept in a mellow condition continually; but do not work the ground when wet.

During the second summer a cane or shoot is produced from each of the two or three buds which were left on the vine last fall. Of these young shoots, if there are three, leave only the two strongest, tying them neatly to the trellis, and let them grow unchecked to the uppermost wire.

With the strong-growing varieties, especially when we intend to grow the fruit on laterals or spurs, the two main canes are pinched off when they reach the second horizontal wire, whereby the laterals are forced into stronger growth, each forming a medium-sized cane, which is shortened in the fall to from four to six buds. One of the two main canes may be layered in June, covering it with mellow soil about an inch deep, leaving the ends of the laterals out of the ground. These will generally make good plants in the fall for further plantations; with varieties which do not grow easily from cuttings, this method is particularly desirable. Figure 7 shows the vines tied and pruned accordingly, at

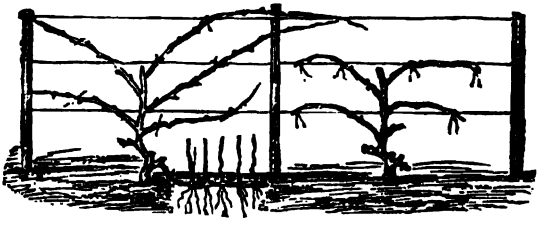

Fig. 7.—Layering a main cane of grape.

the end of the second season; the cross-lines through the canes showing where they are cut off or pruned.

Another good mode of training, recommended by Mr. A. S. Fuller, is to bend down in the fall, at the end of the second season, the two main canes of the vine in opposite directions, laying and tying them against the lower wire or bar of the trellis, as shown in figure 8, and shortening them to four feet each. Then let five or six of the buds on the upper side of the arms be grown into upright canes. All buds and shoots not wanted for upright canes should

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be rubbed or broken off. This latter method is not well adapted for varieties which require covering in winter. When the canes are started lower, near the ground, and cut loose from the wire, they can be easily covered with earth.

Fig. 8.—Growing uprights from laterals.

At the commencement of the third season, tie the canes to the trellis. For tying, any soft string or stout woollen yarn, or the shreds of old gunnies, may be used; some obtain their tying material from basswood bark, soaked for two weeks or longer in running water. Tie closely, and as young canes grow keep them tied, but in all cases, take care against tying too tightly, as the free flow of sap may be obstructed.

The ground is now plowed and hoed again, as before. Give one (6 in.) deep plowing in spring, taking care, however, not to cut or tear the roots of the vines, and two more shallow (three or four in.) plowings in summer. From each of the buds left at the last pruning (as shown in the preceding figures), canes can be grown during the third year, and each of these canes will probably bear two or three bunches of fruit. There is danger of their being injured by overbearing, on which account the bunches should be thinned out by taking away all imperfect bunches and feeble shoots. In order to secure future fruitfulness of the vine, and at the same time to keep it in convenient control, we would allow no more wood to grow than is needed for next season's bearing, and for this purpose resort to spring pruning.—*Rural New Yorker.*

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RAISING GRAPE-CUTTINGS.

During a recent visit with Mr. Wilson, of Atlantic, Iowa, who raises more grape-cuttings than any other man in the west, he gave his method of raising the thousands of young vines which he sends all over the country. Mr. W. said: "I prefer six or eight inch cuttings with two or three buds on each. My soil is very mellow; being composed of vegetable mould 18 to 24 inches thick, with an underlying stratum of very porous clay. The cuttings are prepared in December, and tied in bunches of 100, with the butts all one way. These bunches are inverted, put in a trench, and covered with 4 inches of mellow soil, which, in turn, is covered with a thick coating of manure; when they are left until spring. As soon as the frost is out of the ground, the manure is removed, and the bunches are left in the trench for some time for the roots to callus. When sufficiently callused, the cuttings are taken up and placed in water 24 hours to get thoroughly saturated. They are then stuck in the ground 3 or 4 inches apart, in rows 3 feet apart. By the aid of a line, in very mellow soil, these cuttings can be put in the ground very rapidly. Good cultivation is given through the summer, and the vines are ready to ship the next autumn and spring. For ordinary soil it would probably be necessary to make holes to receive the cuttings."

This is the method for ordinary varieties. A plan employed by Mr. Wilson for hard-wood varieties like the Delaware, that are difficult to grow from cuttings, is as follows. The cuttings with two or three buds are fastened to two-inch pieces, about the size of a lead pencil, of the roots of some hardy variety like Ives' Seedling or Concord. The vines from which these root pieces are taken must be young and thrifty. The fastening is done by means of grafting wax and thread, wound over and over and the end tucked in. These are packed in the cellar until spring, and then set out. The roots start from the callused portion.— *Prairie Farmer.*

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PRUNING THE GRAPE.

Calling on a gentleman in early spring some years ago I noticed that he had carefully tied his grapevines to the wires of the trellis, and from thence trained them to the side of a building, some of the shoots having fully eight feet of new growth. I asked if he is was not going to trim them. "Oh! I have," he replied, "I cut off nearly six inches of wood." I deemed it my duty to explain to him the process of pruning, and while so doing, properly trimmed a single vine, he unfortunately not allowing me to do more, but insisting on training them in the old way. I happened in the same neighborhood the following fall and found him gathering grapes, and his first words on seeing me were: "Young man, I am convinced I don't know how to take care of my vines. When you trimmed this one I was angry with myself for allowing you to do it, and sorry you was such a fool, as I thought then." On the vine I had trained hung thirteen good-sized, well-formed and well-ripened bunches, while high up on the other vines were fifteen or twenty unripe and imperfect bunches. There exists a natural timidity to use the knife or shears on plants and trees, but it must be overcome if the owner would have a full crop of fine fruit. Grapevines should be pruned during mild days from November to March, while in a dormant state; never defer the work until late in spring after the sap has started.

The grapevine bears its fruit on shoots made the present year, or, in other words, on the new wood. We will suppose we have just obtained our vine from the nursery, two years old. This vine may have one or more shoots, which may all be cut off except the strongest, and this pruned to within two or three eyes of its base, *i. e.*, where it joins the main vine. The second season follow the same course except allowing two of the strongest shoots to remain, which should be bent in either direction horizontally and fastened to the lower wire or bar of the trellis, with soft woollen strings or leather bands. The third year these two shoots will force

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out new ones which should be trained upward. After this season's growth cut back the two main shoots to about three feet from the base and the upright ones to a foot from where they join the lower shoots. The fourth year each of the last year's shoots is cut back to within three feet of its base; after this year, when a few bunches of fruit will be had, the spurs should be pruned every winter to about three eyes. Of course it is understood that fruit is what is desired and not wood, and therefore a system of pruning must be followed similar to the one here described. Each fruit-stalk should be allowed to produce two bunches of fruit, and when this stalk has made three to five leaves beyond the last bunch of fruit the end should be pinched off, as must also all laterals which will appear. I consider this system one of the best of the many practiced. In pruning the grape the cut should be made about half an inch above the bud, not close to it, as in hard-wood trees.— George R. Knapp, in *New York Tribune.*

THE GRAPE ROT.

Of late years the attention of grape growers has been annually called to a number of diseases of the berry, by which their vintage has been much lessened. As a rule these diseases are known as "the grape rot," and no little anxiety has been felt as to the cause and probable duration of the disease.

I shall try to bring together as briefly as possible the facts which have come under my observation, through specimens and inquiries from various parts of Wisconsin. It is probable that there are other forms of the so-called rot which are familiar to members of this Society, and the main object of my paper is to direct their attention to the subject, with the hope of utilizing their observations in the further study of the diseases of the grape.

Some berries show a discolored spot about an evident injury on the surface, which most frequently appears as a minute puncture, suggesting at once the idea of insect

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work. Occasionally such berries crack open, especially in wet weather, as a result of the osmotic imbibition of water by the pulp cells near the puncture.

An examination of grapes affected with this form of the disease shows that they often contain small caterpillars. These larvæ feed on their pulp and seeds. From its resemblance to the larva of the codling moth, this insect (*Eudemis botrana*, Schiff.) has been called the Grape Codling (Fig. 1–2). It is also known as the Grape-fruit Worm and the Grape-berry

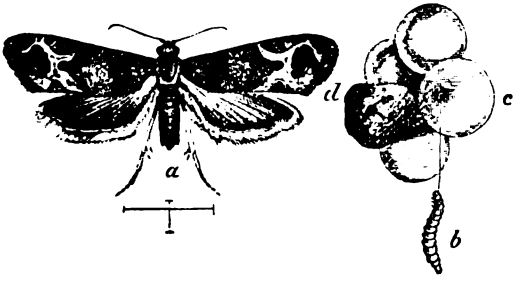

Fig. 1.— Grape Codling; *a*, moth, *b*, larva, as it drops from the fruit, *c*, *d*, injured berries.

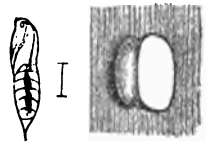

Fig. 2. — Grape Codling;* pupa and flap of leaf under which it transforms.

Moth. When grown the larva deserts the fruit and, as a rule, cuts a litle flap from one of the nearest leaves, which it webs over it, after the manner of the Tortricides or Leaf-rollers, to which group of insects it belongs (Fig. 2). In this retreat it changes into a pupa from which the small moth into which it transforms finally emerges. A very good account of its transformation may be found in Prof. Riley's First Report on the Insects of Missouri, pp. 133–6.

The spring brood of larvæ are said to eat the leaves of the grape. It has also been shown† that they sometimes "feed on the tender shoots of the common Iron Weed (*Vernonia noveboracensis*), which they web together for their better protection. When mature they desert these retreats and cut little flaps from the larger leaves, which, folded over and fastened at the edges, protect them during the pupa stage." The insect "has also been bred from larvæ webbing the leaves

*The cuts illustrating insects are from Dr. Riley.

†Miss Murtfeldt: Psyche, 1881, III, p. 276.

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of the Tulip Tree (*Liriodendron*), and of the Lead Plant (*Amorpha*);" from which it will be seen that its food is supplied by plants of the most diverse nature.

A somewhat similar injury is caused by the Grape Cur-

Fig. 3.— Grape Curculio; *a*, front leg of beetle, *b*, larva.

culio (*Craponius inæqualis*, Say) (Fig. 3.), the larva of which can be readily distinguished from the Codling by being footless, while the latter has three pairs of true legs and five pairs of prop-legs or abdominal legs. When mature the Curculio larva deserts the grape, and transforms in the ground, emerging in the fall as a beetle, in which form it passes the winter.

Other grapes, more frequently seen about Madison, Wis., and received in quantities from other localities, show no sign of insect work, although, as will be seen directly, they sometimes appear punctured. They are commonly more or less deformed, often flattened in places, where they are of a brown or gray color, according to the progress the disease has made. In short, their appearance is much as if they had been scorched on these places, which are usually of rounded outline.

This form of the rot is common on several of the Rogers Hybrids, and appears to be quite similar to what is known in several parts of Europe as Anthracnose. An examination with a hand lens sometimes reveals nothing but a drying of the epidermis. Often small black spots are visible in the gray back-ground. Sections of the spots, passing through these points, show that they correspond to microscopic cavities in the dried skin of the fruit, which contain numerous very small spores or reproductive bodies, characteristic of the fungus *Phoma uvicola* B. and C., which has long been known in connection with the "dry rot" of

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the grape. The *Phoma* is so universally associated with this form of the disease in the United States, that it is held by some to be its cause. My own observations are too limited to admit of a positive assertion on this point, but while the *Phoma* unquestionably sometimes develops on grapes which are already diseased from another cause, some specimens certainly show no injury that I have been able to make out other than that due to this fungus.

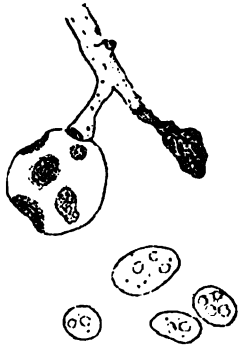

Fig. 4.—*Phoma uvicola;* Grape attacked by the Phoma, natural size. Four spores. (+675)*.

The genus *Phoma*, to which this fungus belongs, is one of a large number of "form genera," many species of which are known or at least suspected to be early forms of fruit of species which, in the winter, appear in other forms, and have often been given other names. Like the larvæ of insects, these imperfect forms can sometimes be watched through their transformations, but the work is much more uncertain and difficult. Whether *P. uvicola* is a good species, whether it is a form of one of the many known grape fungi, or whether it belongs to a species, the perfect fruit of which is as yet unknown, is not certain. Such culture experiments as I have been able to make have yielded only negative evidence.

* The specimen from which the figure was made was received from a correspondent in Missouri, and differed from those mentioned in the appearance of the diseased spots, which were of a dull, purple brown. The spores in this case were rather larger than in the typical form of *P. uvicola*, (4–12 μ, usually 10–12 μ) but I should say that the difference is scarcely specific.

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Another form of rot which is, perhaps, the most destructive of all in Wisconsin, manifests itself by the shriveling of the berries, either when they are about grown or long before. Many of these fall to the ground, while others remain attached to the plant. So numerous are those that suffer, that what were at first full, symmetrical clusters, finally become reduced to irregular bunches of scattered fruit, and entire clusters are sometimes destroyed.

Berries which shrivel in this way occasionally show one or more livid spots on their surface. In some instances these show no traces of insect injury, but ultimately bear a crop of *Phoma uvicola*. In Canada an injury of this sort is caused by the grape-seed maggot, which I have not yet seen. In his first report, Prof. Riley described this as the probable larva of some curculionid beetle, but it was subsequently s own to be that of a chalcid fly (*Isosoma vitis* Saund.) (Figs. 5, 6). The maggot feed s in the seeds of the grape, one or two of which enlarge considerably, as a result of its attack.

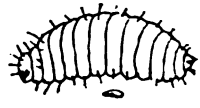

Fig. 5,—Larva of *Isosoma*, natural size and enlarged.

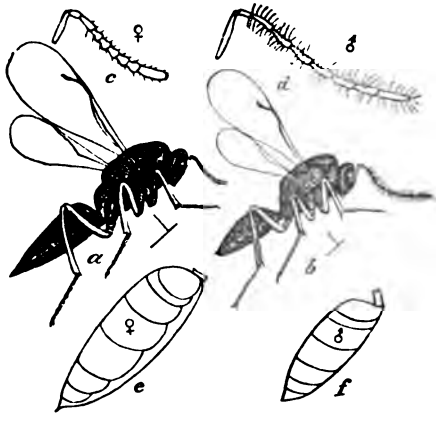

Fig. 6.—*Isosoma vitis*; *a*, female, *b*, male, *c*, antenna of female, *d*, antenna of male, *e* abdomen of female, *f*, abdomen of male.

Last fall, on the invitation of Mr. A. L. Hatch, of Ithaca Wisconsin, I spent several days at his home in the examination of rotting grapes. The greater number of the diseased berries in his vicinity were simply drying up and

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falling, with no external sign of insect attacks. These berries, when cut open, showed quite uniformily a discolored appearance before any trace of injury could be seen at the surface. As a rule, while most of the pulp remained unaffected, a zone of browned tissue could be seen running almost or quite around the fruit between the seeds and the skin. In sections of this diseased tissue I was able to make out the presence of a fungous mycelium, which is evidently that of some *Peronospora*, and possesses the small, round haustoria or suckers of the mycelium which is found in grape leaves attacked by the American grape mildew (*Peronospora viticola*, B. & C.) (Fig. 7). Sections of grapes

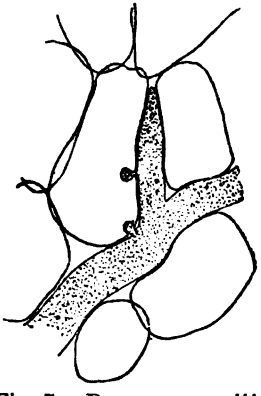

Fig. 7.—*Peronospora viticola*, mycelium in berry, (×275).

Fig. 8.—*Peronospora viticola*. fruiting threads, from leaf (×225).

containing this mycelium were placed in damp air, and in the course of a few days several of them produced a small quantity of the fruit characteristic of this *Peronospora* (Fig. 8).

It appears, therefore, that the most destructive form of the grape rot with us is a direct result of the growth, in the berries, of the fungus which causes the common leaf disease of the vine. This fungus, forming, when in fruit, frosty white patches on the under surface of the leaves, which are browned above in corresponding places, should be familiar to every grape grower; but it is unfortunately the case that many horticulturists do not distinguish it from the *Oidium* or true, mildew of their upper surface.

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Heretofore this *Peronospora* has been found only on the vine, fruiting abundantly on the leaves, sometimes on the shoots of the plant, and rarely on the fruit, the epidermis of which, perforated by few stomata or breathing pores, usually prevents the emergence of its fruit-bearing threads. During the past season it has also been found on a near relative of the grape, the Virginia creeper (*Ampelopsis quinquefolia*), in several parts of the West, *e. g.*, in Minnesota by Prof. Farlow, and in two localities in Wisconsin by myself and Mr. L. H. Pammel, one of my students.

From what has been said, it will be seen that what is generally know as "the grape rot" is not one disease, but that it is a generic name, including several well marked disorders. For convenience I append a key that will probably enable any careful observer to determine the cause of either of these, or if there are still others, to determine that fact.

1. Insects not found in the pulp, 2.
   Insects found in the pulp, 4.
2. Minute black dots on a dried gray or brown spot, *Phoma uvicola* B. & C.
   Berries shriveling, not appearing scorched, 3.
3. Berry not punctured, seeds not enlarged, *Peronospora viticola* (B. & C.).
   Berry punctured or discolored at one spot, one or two seeds enlarged, containing a footless maggot, *Isosoma vitis* Saund.
4. Larva footless, 5.
   Larva with 16 legs, *Eudemis botrana* (Schiff).
5. About $\frac{1}{4}$ in. long, not hairy, *Craponius inæqualis* Say.
   Less than $\frac{1}{8}$ in. long, with fleshy hairs, rarely, *Isosoma vitis* Saund.

European vineyards have suffered much of late from related diseases, but authorities have differed as to the cause of some of them. Planchon has found anthracnosed berries infested by the fungus *Sphaceloma ampelinum* De Bary. Passerini has ascribed the injury to *Ramularia ampelophaga* Pass.; while Cornu has traced the disease to the American *Phoma uvicola* B. and C., above mentioned and still others have found its cause in one or other of the

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many fungi of the vine. More recently Prillieux, having examined grapes from this country, has shown that in some cases, at any rate, the *Phoma* only grows on tissues already diseased through the previous action of *Peronospora viticola*.

REMEDIES.

With respect to remedies for the *Peronospora* rot several points are suggested. In damp, hot weather the fungus spreads readily from plant to plant by means of the spores borne in the frost-like tufts everywhere abundant on diseased leaves; hence it has been proposed to kill these by dusting the affected plants with sulphur, applied by a sulphur bellows. Where the disease is local in its appearance this may prove effectual if promptly resorted to, but it should be borne in mind that the actively vegetating part of the parasite, its mycelium, lives in the interior of the diseased parts, where it is protected from all topical applications, and for this reason can not be destroyed by them like the European *Oidium*. There is consequently no means of reaching the fungus after it has once entered the plant.

The most promising time for attaking the pest is the fall or winter. On the approach of the latter season, winter-spores (Fig. 9) are produced in some of the leaves permeated by mycelium. These spores fall to the ground with the leaves and lie dormant until spring, when they germinate, the mycelium proceeding from them growing into any young grape leaves or shoots with which the spores may be brought in contact. Up to the present time these spores, which do not appear to be very abundantly formed in this country, have been found only in the leaves of the grape, but it is possible that they may be equally or even more abundant in the Virginia creeper, so that any measures intended to destroy them should extend to both host plants of the fungus.

Fig. 9.—*Peronospora viticola*, oospores, (×245).

It is not only possible, but quite probable, that the careful collecting and burning of all grape and creeper leaves in the fall would so lessen the number of these spores left to germinate in the following spring, as to much simplify the

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problem of preventing the spread of the disease by the judicious use of sulphur. To secure any real good this treatment should be adopted by every one who owns a vineyard, and few wild plants of either the grape or Ampelopsis should be allowed to grow, unwatched, in the vicinity of valuable cultivated plants.

Bagging the young fruit clusters, a process thought very favorably of by some persons, especially when the vintage of a few choice varieties is to be saved, has been recommended as a preventive of the rot caused by *Phoma*. It will, however, be of little use against *Peronospora*, which usually, if not always, reaches the berry through its stalk, and not by direct surface inoculation. On the other hand, bagging may protect the fruit from its insect enemies if properly done.

The prompt destruction of berries attacked by either curculio or codling, and the suppression of iron weed near the vineyard, with the crushing of any pupæ found under the characteristic flaps made by the codling, will likewise tend to keep these insects in check.

Perhaps some members of the Society may be disposed to test the remedy suggested by A. B. Coleman, in the *Rural New Yorker* for November 3, 1883, viz: the removal of every vestige of vegetation for a distance of at least four feet in every direction from the diseased vine, and the scattering over this part of the soil of enough fresh air-or water-slaked lime to whiten it, repeating the dressing if it be removed by rain.

It has also been noticed that grapes which get much sunlight seldom rot badly; and there is doubtless much truth in the statement of Gen. Clay (*Rural New Yorker*, July 28, 1883), that grapes trained against a wall are less susceptible to the rot than those trained to stakes or trellises; although some exception might be taken to his views of the dyspeptic nature of the disease — Wm. Trelease, in *Trans. Miss. Vall. Hort. Soc'y.*, II.

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BAGGING GRAPES.

Within a few years, the bagging of grapes has occupied the attention of many horticulturists. One who has given much attention to this subject, says: "If the application be made in time the paper bag will preserve the cluster in more exquisite perfection than can be secured in any other way. The grapes come forth luscious and beautiful enough to amaze Nature herself."

When to bag.— The only safe rule is to apply the bag as soon as the cluster is formed. If delayed too long, the spore of disease may have attached itself to the berry and result in rot. Some have applied the bag before blossoming has taken place. As the new shoot is very tender and brittle, great care must be exercised not to break it.

How to bag.— Take manila or any other paper bags; cut off the upper corners in order to wrap the upper portion around the cane; place the cluster inside the bag, wrap the bag around the cane, and then pin it.

Size of bag.— This depends upon the usual length of the cluster, and whether more than one cluster is placed in a bag. A two or three pound bag is sufficient for most single clusters.

Results of bagging.— The cluster will average larger, ripen later, color in general better, produce larger berries, and the bloom will be preserved more perfectly than in those not bagged. As to flavor, opinions vary, some think it is better, others that it is not improved.

Bagging as a prevention of rot.— If applied early enough, it is a prevention. Rot is found in some cases in the bags, but mostly takes place after the grapes are ripe.

Bagging as to the splitting of the grapes.— Many of the thin-skinned varieties split badly in the bags. The Elvira, which, out of bags, splits so badly as to be comparatively worthless, owing to the crowding of the berry in the cluster, also does the same in bags.

The Duchess keeps its color when bagged; Delaware, as

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a general rule, becomes deeper; Brighton, lighter in color. Niagara improves in color and flavor.

The present summer many will bag grapes by way of experiment. It is doubtful if bagging will become general in vineyard culture, as the extra expense incurred thereby is not made up in the sale of the fruit. To the ordinary purchaser of grapes in the market, fine clusters, large berries, pure color and bloom, and exquisite flavor are secondary considerations. To the amateur, or those who enjoy to sit under the shade of their own vines, however, these qualities are precious; and, as the experiment of a few bunches requires but little time and expense, it is well worth a trial by those who grow grapes for their own use.—J. B. Rogers, in *American Garden.*

WHAT OTHERS SAY.

Take any paper bag 7x10 inches or thereabouts — cut down the sides a little, slip in the bunch, fold the top over the cane and pin together. Leave it until the first slight frost.—*Rural New Yorker.*

Acting under the *Rural's* instructions, I bagged 600 bunches, embracing 30 varieties of grapes. The difference was so marked in comparison with the exposed bunches that I hope to bag 1,000 bunches next year, for in spite of severe frosts the quality of the grapes holds good at this date within the bags upon the vines, and the grapes would have been lost or ruined without their paper covering — G. W. P., in *Rural New Yorker.*

A correspondent asks for advice on the propriety of bagging grapes. The advantages are, protection from insects and birds; to some extent exemption from rot when that disease prevails; but more particularly in the fine appearance which the bunches present by freedom from external injury and with the undisturbed bloom of the berries. Sorts which sell at high prices pay for the expense of bagging; common grapes do not. Where performed for profit, the work must be systematized, the bags made by wholesale

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methods, and the persons who apply the bags must understand the business of applying them rapidly. As the bags retard somewhat the ripening, the grapes keep longer and may be supplied to purchasers for a longer period, and the bags afford some protection from autumn frosts. To prevent rot, the bags should be applied soon after the fruit sets, or before it is half grown; otherwise the operation may be deferred till nearly the time for coloring. Manila paper is the best material, and the upper fold should be drawn over the bunch and pinned, so as to form a roof to exclude rain. Sometimes bagged grapes have been badly injured by long rains through the bags retaining moisture and causing cracking of berries. Time will determine to what extent the practice will ultimately prevail in vineyard culture.—*Country Gentleman.*

The utility of this practice is not yet settled by grape-growers generally, nor the best time ascertained in the season when the work should be performed. External influences vary, and give diverse results. The operation will hardly pay when the fruit sells at low prices. The same reason does not exist in all localities in favor of bagging. Growers can arrive at the most satisfactory conclusion as to its utility by making a fair trial. Caywood says the bags may be ordered from any paper warehouse, and that two-pound manila bags cost $1.80 per 1,000.—*Country Gentleman.*

The common two-pound paper bags, as used by grocers, such as can be obtained in most towns at about $1.75 per thousand, are suitable for protecting bunches of grapes of the average size. Turn the top down, all but the corner where the stem of the bunch passes in, and one pin will at once make it secure against birds, insects and too easy temptable eyes. Applied early in June, there is little danger left from flying spores. The grapes look fairer, are sweeter, and keep better when thus incased. They can be left longer on the vine to ripen the more fully.—Experience, in *New York Tribune.*

Simply inclosing the bunch, when fairly formed, in an or-

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dinary paper bag, and tying a string loosely around the stem, or fastening with a pin, has decided advantages. Insects are prevented from puncturing the fruit. The berries color and ripen more evenly; the various forms of fungi do not attack, and the owner in most cases is rewarded with a nice crop of fruit when otherwise he might not obtain a perfect specimen.—*New York Tribune.*

The bagging of grape bunches, and again the unbagging, is too much of a job for the indolent, but it has all the good effects that Mr. Hoopes describes, besides the great merits of protecting the berries from birds, etc., and of allowing of fuller ripening, and making the keeping of the fruit for Christmas use an easy matter — nothing more being requisite than leaving the baskets of grapes in the bags undisturbed in a cool room, dry, yet not sweepingly dry.—Quis Quis, in *New York Tribune.*

During the discussion of the New Jersey Horticultural Society, it was stated that carbolic acid was an effectual remedy for grape rot, and that an ounce dissolved in five gallons of water, and sprayed over the bunches when the rot appears, will stop its farther progress. In this connection Secretary Williams said he bagged all kinds of grapes with success. Three-pound manila bags cost from $1.15 to $2 a thousand, and he paid $1 a thousand for putting them on. E. P. Beebe said that the bags should be put on as soon as the grapes had formed; but he did not think the operation would pay when the fruit sold for less than ten cents a pound.—*Country Gentleman.*

Paper Bags and Pins — I am more than ever pleased with the effects of using paper bags on grapes. Not so much on account of their preventing rot in a great degree if applied early in June, or of their wholly precluding the serious loss by bird ravages, as for the perfect condition in which the fruit keeps, entirely free from mould and fresh and beautiful as when picked; and with no trouble at all but that of putting the grapes, while still in the bags, on shelves or in suspended baskets in an airy, cool, dry room. The bags can

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be used as effectually a second and often a third season, and so may the pins. These get rough with rust, but if put into a bottle and covered with dilute muriatic acid (about two-thirds water) for ten to thirty minutes, until the rust spots are eaten off, they will be smooth and sharp as ever. Many rinsings with water are necessary to remove the acid, which would otherwise continue to corrode the pins. Its effects while present, will be seen by bubbles of hydrogen forming on the pins and rising through the water with quick ascent. This gas is separated from the water by galvanic decomposition in presence of the immersed tin and iron. The pins may be kept dry, or, better, stored in a bottle of kerosene until wanted again next June.—Hortus, in *New York Weekly Tribune.*

Paste—A water-proof paste is made as follows: mix rye flour to a thin cream with water and boil it to a paste; add an equal quantity of common glue reduced with water so as to make a thin jelly when cold. Make this hot and mix thoroughly with the hot paste; then stir in it one ounce each of linseed oil, turpentine and common varnish to the pound of glue. The reason why grocers' bags resist moisture is the toughness of the paper rather than the paste used: this is made of rye flour paste to which galbanum dissolved in cold water is added.—*Rural New Yorker.*

FERTILIZERS FOR GRAPES.

Experiments with commercial fertilizers in vineyards, continued for four years in the Rhine district, have given encouraging results, showing that such manures can be profitably substituted for stable manure, as to effect both on quantity and quality of the fruit; although in general no important advantage over stable manure is gained. Nevertheless it may be comforting to those who cannot get for their vines all the stable manure they would like, to know that by judicious use of superphosphates, potash, salts and nitrogen compounds, they may be able to get with the same

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outlay as for stable manure just as good crops, and often better ones. It was observed in these experiments that less favorable results were obtained with white than with colored grapes. The explanation is given that white grapes are deeper rooted, and that the manure should have been put in deeper to get the same results. The best manner of applying the fertilizer was found to be to make, with an iron post-hole bar, narrow, oblong excavations about eighteen inches deep, at short distances from the vine, and to sprinkle in each hole four or five ounces of the manure; four or five such excavations may be made around each vine, and they are left open to collect the rain for the solution and distribution of the plant food; the application is made late in fall or early in spring. A mixture containing 6 per cent. of soluble phosphoric acid, 6 per cent. of potash as sulphate, and 3 per cent. of nitrogen as ammonia salts or nitrate, has given the best results; for deeper-rooted grapes the nitrogen is better applied in the form of nitrate so that when taken into solution it may sink deeper.—Dr. G. C. Caldwell, in *New York Tribune.*

GRAPE SAYINGS.

FROM VARIOUS SOURCES.

It is well for beginners to know that when they set out grape-vines they need not look for abundant crops in less than four years.

Prepare the ground in fall; plant in spring.

Plant vines before you set trellises.

Give the vine plenty of manure, old and well decomposed, for fresh manure excites growth but does not mature it.

We all like well mannered dogs because of their friendliness, which flatters our self-love, and their lively show of gratitude for good treatment. A recent writer cuts deep when he offsets this by the remark that tens of thousands of homeless, friendless, little children would be grateful too for like care and keeping. An excellent suggestion is that of "inserting a few cuttings of dog under newly set vines or

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trees." Equally good for old vines, placed anywhere within reach of their long roots. This is more effective in every way than pulling the dogs', canines — poor creatures!

Luxuriant growth does not always insure fruit.

Dig deep, but plant shallow.

Young vines produce beautiful fruit, but old vines produce the richest.

Prune as soon as the leaves are dead in autumn to insure growth; but in spring to promote fruitfulness.

Those who prune long must soon climb.

Prune spurs to one developed bud, for the nearer the old wood, the higher-flavored the fruit.

Grape-vines bear their fruit on the current year's canes, growing from the previous year's wood, and the principle of pruning is to leave only such an amount of last year's wood as shall produce a proper number of bearing canes, and not so much fruit as to be unable to ripen it, and the wood for future productiveness. The most approved method in pruning now is to cut away most of the bearing wood and depend upon renewing the bearing arms for the next season.

Vine leaves love the sun; the fruit, the shade.

Every leaf has a bud at the base, and either a bunch of fruit or a tendril opposite it.

A tendril is an abortive fruit bunch,— a bunch of fruit, a productive tendril.

A bunch of grapes without a healthy leaf opposite is like a ship at sea without a rudder — it can't come to port.

Laterals are like politicians — if not checked they are the worst of thieves.

Tie a cord *tightly* about several grape-vine canes just below a good-sized bunch. This will not prevent the flow of sap to the bunch, but it will impede its return and cause the berries to grow larger.

Complete maturity of the grape is indicated by the concurrence of the following signs: The stem of the bunch turns from green to brown; the bunch becomes pendant; the berry has lost its firmness; the skin has become clear and translucent; the berries are easily separated from the skin; the juice of the grape has acquired an agreeable

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flavor; has become sweet and glutinous; the seeds have become void of glutinous substances. These are the signs given by several French authors, and are here taken from Prof. Du Breuil, who says, nevertheless, that under some circumstances the grapes should be gathered before arriving at the state of maturity indicated by these signs, and under other conditions should be gathered even later.

"Shall we continue to plant the Concord as a market grape?" This is one of the questions to be discussed at the next meeting of the Western New York Horticultural Society. "Straws show which way the wind blows." With our present experience and convictions we shall never, for any purpose whatsoever, except, it may be as a stock for other varieties, plant another Concord.—Carman.

Favorable stories have been told in our western societies for a number of years past in regard to the hardiness of vine, perfect leaf and high character of fruit of the Worden. Slowly, without undue puffing, it has made its way, on its own merits, from point to point until now the word comes from a thousand sources that it is the king grape of the Mississippi Valley, at least north of Missouri. The call for vines will be immense until such time as our people are sure that we have something better. Persons in the east, who have a low opinion of its quality, should defer final judgment until they have had a chance to eat a few bunches ripened in the hot, dry air of Illinois and Iowa.—Professor Budd.

No trumpeting was ever done to boom up the Worden grape. It has gained a topmost place in the estimation of growers, solely by its own quiet annual exhibit—to those who have the true sort—of its distinct and decided superiority to its great parent, the Concord. No mother and daughter were ever more alike than they are, but the daughter is the princess.—Hortulanus, in *New York Tribune.*

Early in June rose bugs on grapevines begin to appear and there is no use trying to get rid of them by the application of any substance that will not at the same time destroy

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or nearly ruin the fruit. The only efficient thing is hand-picking and crushing, or drowning in a mixture of creosote and water. At first this may be no trifling job, but the number will usually grow less and less every year, and finally become almost extinct. After the third season of their appearance very few came on my vines, and I hope in the fourth (the present, with me), none will be found. If suffered to remain, they finally drop to the earth, bury themselves there, and propagate a new and increased brood to come forth suddenly, and nearly all at once, the following year.—A. B. Allen, in *New York Tribune.*

Mrs. L. N. Bonham repelled rose bugs by hanging under her grape-trellis open bottles of bi-sulphide of carbon. The theory, as explained in *The Ohio Farmer,* is that the pronounced odor of the drug is offensive to the insects, which are partial to flowers of delicate perfume.

GRAPE DODDER.

Insects, numerous as they are, are not the only enemies with which the grape grower has to contend. The dreaded mildew is a microscopic parasite plant, and now we learn of another plant, also parasitic, but by no means microscopic. S. F. Blackman, Ocean county, N. J., in pruning his vines, came across a "singular growth," which he sent us. The affair is properly described as a "growth," but it is not of the vine, but upon it. It is a cluster of seed pods of a species of dodder — *Cuscuta,* of which there are one or more species found all over the country. The dodders germinate from seeds in the ground, throwing up long slender, leafless stems, which twine around and climb up the stems of other plants. There soon appear upon the stem of the dodder little disks or "suckers," which penetrate the stem of the other plant and through which it robs its host of its juices.

Having established itself, the dodder, finding it easier to steal its food than to prepare it, has no further need of a

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root, and soon severs all communication with the soil. It bears minute whitish flowers in clusters, which are succeeded by small pods, each usually with four seeds. The flowers and fruit, though small, are interesting in their structure, which places the plant in close relationship with the large and showy morning glories, both belonging to the same family.

Some of the dodders are common in damp places, and in summer their orange-colored stems, like masses of tangled yarn, are quite conspicuous. The origin of the botanical name *Cuscuta*, is not known, but Dodder is the plural of *dodd*, the word in the Frisian language for bunch.

From the manner in which the plant subsists, it is most injurious to those plants on which it grows. The Flax Dodder and the Clover Dodder of Europe, are often destructive to the important crops they infest. The first named has been introduced into this country, but is not at all common. There is a Dodder which infests the Alfalfa or Lucerne, the important forage crop of California and other far western states, and which was first determined and figured in the *American Agriculturist*, in December, 1874, as *Cuscuta racemosa*, var. *chiliana*.

The three species already referred to form loose flower and fruit clusters, which present a very different appearance from the one now sent, in which the pods are closely crowded in a dense mass, that is sometimes two inches in diameter. It is a native species (*C. compacta*) and the only one of about a dozen belonging to the Atlantic states that attacks cultivated plants. We have known it to injure young apple stocks in a nursery, but its occurrence on the vine is quite new, and, though not likely to prove serious, should be known to the vine growers that they may destroy it wherever it occurs. By rubbing off the flower clusters, before the seeds are formed, it may be kept in subjection without much difficulty.— *American Agriculturist.*

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HORTICULTURE AT NEW ORLEANS.

By J. C. PLUMB, Committee of Collection.

It is not within the province of this paper to give a full account of what was the largest exhibition of fruit the world has ever witnessed, therefore, I will briefly give its outline features, leaving the details to be found in published records of the great exposition.

THE PLACE AND OCCASION.

At the most southern of the large commercial centers of our country, near the lower edge of the great Mississippi basin; latitude 30°; in a sub-tropical climate; where is perpetual summer (when the sun shines). It was under the auspices of the Cotton Centennial and World's Fair, and in connection with the annual meeting of the American Horticultural Society, thus bringing foreign countries to compete with our own, as well as the states of our own country into a competition never before so extensive.

It also brought together the best skilled and most energetic practical horticulturists of our country to set up the show, as well as a great number of studious visitors who found this the main attraction.

HORTICULTURAL HALL

is 600 feet long and 100 feet wide, with transept wings at the center, 100 feet by 50 feet each side, giving an entire area of about 70,000 feet. It is a light airy structure, the frame mostly of wood; a grand arch, glazed throughout with heavy glass on a plan new to this country. The height of this arch is throughout about 50 feet, with a central tower 100 feet high, under which there is a grand series of fountains which give a most refreshing coolness when the mercury reaches into the nineties. There is also the hot house, where the tropical plants are especially cared for. The entire margin of this hall is thickly set with growing plants in great variety, mainly from Mexico and the West Indies,

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while the central portions are occupied with tables for the display of fruit, and the whole floor area is paved with shells from the gulf.

The objects which first take the eye of the visitor from the north are the great variety of strange plants from the tropics. The cocoanut palm, 45 feet high, loaded with fruit in different stages of growth, the giant cacti, 30 feet high and one foot in diameter; the graceful banana and odd looking orchids, the latter of which being "air plants," are hung on the walls of the hot house with only a bit of wood to cling to. Here we find plants arranged in groups and families, the rare and the new with those more familiar, all interesting and instructive to the botanist and florist. But the center of attraction was

THE GREAT FRUIT SHOW.

California first came to hand with 1,045 plates and 90 varieties of apples; 120 plates and 10 varieties of pears; 21 plates and 7 varieties of quinces; 177 plates and 18 varieties of grapes; 78 plates and 5 varieties of lemons; 30 plates and 8 varieties of persimmons; 10 plates of oranges and 10 of pomegranates, with medlars, Italian chestnuts, English walnuts, filberts, almonds and other nuts. Oregon and Idaho came in for a share of the prizes for Pacific coast apples, in smaller lots.

The show of Citrus fruits from Florida and Jamaica was grand. At one stage of the exhibit there were 10,000 plates of these fruits on the tables, embracing the common oranges and lemons of commerce, with a great variety of the fruits of the tropics seldom or never seen in our markets.

But the chief point of attraction was the great display of the prince of all fruits,

THE APPLE.

As we enter the main door of the great conservatory we come first to Wisconsin's large display of 1,000 plates and 250 varieties of apples; then Iowa with 125 varieties and 500 plates; Michigan, 200 varieties and 400 plates; Illinois, 250 varieties and 1,000 plates; Pennsylvania, 120 varieties and 150 plates; Ohio, 100 varieties and 200 plates, with lesser

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displays by Maine, New Jersey and other states, while Nebraska with 75 varieties has a spread of 500 plates, which is less than half what they had on the tables before the competitive show began. Minnesota shows only grapes, 13 varieties of which are here in excellent condition, while her apple display is confined to her state exhibit.

At the other end of the hall the magnificent display of apples from the southwest made sharp competition between Kansas, Missouri and Arkansas, and the honors seem about equally divided. Kansas shows 130 varieties and 1,000 plates; Missouri, 134 varieties and 500 plates; Arkansas, 160 varieties and 400 plates, all of which are of wonderful size and perfection, which shows that these states are to lead the country in apple growing. Colorado comes in here with 80 varieties of beautiful apples of medium size, grown near Denver, with irrigation, which are very perfect in form and color, and, with the small collection of big apples from Idaho, are a great attraction.

It is remarkable that these states show fall and winter varieties in about equal condition, after four months of packing and repacking and rough handling that would break down the same varieties grown with us. This is doubtless owing to the uniformly cool and clear weather in which they grew, and which gives them a delicate complexion and tough mealy flesh.

The pears and quinces seem all that could be desired. We find here samples of new President pears, of which one measures five by eight inches, weight, two and three-eighths pounds, the plate of four weighing nine pounds. While viewing this grand spread of fruit, Joaquin Miller remarked: "More gold in the apples of California than in her mines."

Of the foreign exhibits England showed two hundred varieties of apples and France fifty varieties in fairly good condition considering their long voyage and custom house delays; but in size and general appearance they could not compete with our western apples. The pears from France, by two exhibitors, were remarkably fine, consisting of over one hundred plates, and in fair condition. A collection of apples from Russia, of ten varieties, was of much interest

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to northern men, but little could be judged of their quality, as they were mostly past their prime. Mexico showed only two varieties of apples, both small and sweet. Canada, by Charles Gibb, showed some high-colored apples of small size as compared with our own of the same varieties. Minnesota took several prizes on grapes, having twelve varieties in good condition.

New Jersey and Massachusetts had each some five varieties of pears, of which the Kieffer was conspicuous.

The competitive show of apples grown north of latitude 40°, was from five State Horticultural societies, namely: Iowa, Illinois, Wisconsin, Nebraska and Ohio. For the exceedingly well grown and carefully selected collection of the Iowa society, that state took the prize on "best collection, not to exceed two hundred varieties," with fruit mainly from the southwestern portions of the state. For the "best one hundred varieties," our society took the prize, with Illinois competing.

The "best two hundred by individual exhibitor" was given to A. C. Hammond, of Warsaw, Ill., against competition from Iowa, Wisconsin, and Pennsylvania, and "best one hundred" to J. T. Johnson of the same place.

"Best fifty" was awarded to E. M. Griffin, Iowa, against Wisconsin, Ohio, Illinois, Nebraska, New Jersey and Canada, a total of nine competitors.

"Best twenty-five" was given to G. B. Brackett, Iowa, against thirteen competitors.

"Best ten" to Geo. Seagrave, Spring Lake, Mich., against fifteen competitors.

"Best five varieties" to J. M. Smith, Wisconsin, against fifteen competitors.

Among the lesser premiums awarded, Wisconsin took those for 3 autumn, 5 autumn, 5 winter, 10 winter. That for "largest and handsomest" was awarded to Wm. Springer, on Wolf river, against four competitors. This variety also took the prize for "best new autumn apple" against three competitors. Geo. Peffer took the prize on collection of crab apples against Minnesota and Iowa. On "single plates," Wisconsin took the prize on Alexander, Blue Pearmain,

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Colvert, Duchess, Golden Russet, Fameuse, Herefordshire Pearmain, Longfield, Melon, Marsden, Pewaukee, St. Lawrence, Tallman Sweet, Walbridge; and Winter Nélis Pear.

A careful analysis of the awards shows that out of the forty-nine entries for our state, we took twenty-nine premiums on fruit.

For further details of this grand competitive exhibition, I must refer you to the final report from our President, Commissioner Smith, to whose persevering labors our state owes much of its success in this and other departments of the great exposition.

Here I would also gratefully mention the cordial sympathy and free contributions of a large number of fruit growers of our state, who responded so promptly to our appeals for their "best fruits." The following data only are at our command at present:

Wm. Springer, of Waupaca county, furnished 15 varieties of grafted, and a large collection of the seedling apples of that county, about 125 varieties, many of which, from their beauty, added largely to the display; Geo. P. Peffer, also a large collection, which not only helped the state show, but won several prizes to him; Geo. Barnard, Esq., of Plymouth, Sheboygan county, and Mr. Eastman of the same place, sent fine collections; Joseph Plum, Stockbridge, 50 varieties; C. Hirschinger, of Baraboo, 33 varieties; R. B. Bones, of Racine, 20 varieties; E. W. Daniels, Auroraville, 20; Henry Floyd, Berlin, 15; H. Smith and Mr. Daugherty, Green Bay, 30; F. C. Curtis, Rocky Run, 20; also small collections each, from A. J. Philips, Geo. Jeffery, D. Huntley and others, and an especially fine one from Theo. Borst, Esq., Kilbourn, and a small collection of Russian apples from C. Perry of Beaver Dam. We secured choice specimens at several of our fairs, state and county. At the Ripon fair we were greatly assisted by H. W. Wolcott, and at the Walworth county fair by friend Phœnix. But we found that very few specimens so gathered were available at this winter exhibition, except as a guide to secure further selections later on.

The final showing of our state in this department will remain a monument to the faithful efforts of those in charge,

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as well as to our resources in apple growing. The following official report will show how we stand in comparison with other states:

FRUIT.

North of Parallel 40° North Latitude.

Wisconsin	29	$445	.29	Silver	7
Iowa	14	380	.25	"	2
Illinois	12	355	.24	"	1
Minnesota	12	100	.07	"	3
Michigan	9	55	.04	"	1
Vermont	1	50	.03	"	1
Nebraska	7	35	.02	"	0
Ohio	5	30	.02	"	0
Connecticut	1	25	.02	"	1
Maine	4	20	.01	"	0
Canada	2	10	.01	"	0
Pennsylvania	1	5	.00	"	0
Total	97	$1,510	1.00	"	16

OTHER AWARDS.

TREES.

Wisconsin, 14 Premiums, $800. 1 Gold and 8 Silver Medals.

OUTSIDE VIEWS.

One feature of the Exposition not generally noticed is the great variety of trees, shrubs and plants which are now in place in various parts of the park. Many of the states have their individual plant of trees from their home nurseries and forests, which, in compact groups, but with plenty of room for years of growth, are here to show their adaptation to this climate and soil. Among those several and distinct collections none other equals that from our own state in the eyes of professional growers, in variety and perfection, which is due largely to the good judgment of our Mr. Peffer, who made and forwarded the collection.

These groups are to remain as a permanent investment by the several states in this now to be popular resort, and their success or failure will be watched with interest.

In addition to the above mentioned, there are large plats of flowering plants and shrubs which will be in full bloom in the course of a few weeks. There are also long stretches of borders filled with bulbs, thousands of which are showing heir varied bloom. One million of the flowering bulbs were

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furnished by one firm, whose card is modestly displayed along the borders. This outside work of tree planting has been under the superintendence of Governor Furnas, of Nebraska, with the assistance of Professor Tracy, of the Missouri Agricultural College.

LESSONS.

1st. Winter in the Sunny South means great extremes of climate — from 32° to 80° — frequent changes of temperature. The air surcharged with moisture, and rainy days the rule for two months at least.

2d. These conditions are so favorable to the spread of fungoid growths that only those fruits with tough, waxy, outer covering can be safely grown and handled in that climate.

3d. That all fruits in that climate should not only be carefully wrapped, but in well ventilated cases, with the most perfect non-conducting packing possible.

4th. That in the words of our friend Stickney, "there is more money in growing apples in Wisconsin, than oranges in the south, not excepting Florida."

TRUNKS OF APPLE TREES.

Throughout the northwest, orchardists have found, especially during the last three years, the trunks of apple trees, in one way or another, seriously injured or diseased. Sometimes the difficulty is limited to a small area, and sometimes extends so as to ultimately kill the tree. Thousands of apple trees have in this way perished in our own and adjoining states. It seems that no kind, age or size is exempt, though some varieties upon the whole suffer less than others, and on some kinds of soils and exposures less damage occurs.

In studying the matter somewhat closely, four principal kinds of injury have been found, viz.: by insects, by rabbits and mice, by blight and by frost. Of the first and second nothing is to be said in this place, except to mention the wood borers and the so-called "woolly aphis" as the insects specially referred to. The third must also be dismissed with

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a few words. I have elsewhere argued that the so-called "sun-scald" is really blight, produced by bacteria, and this opinion is here further insisted upon, a large number of recent examinations making it impossible to do otherwise. In this case the bark adheres firmly to the wood, at least until it is quite rotten. Not unfrequently new bark forms beneath the old, and so heals the wound and saves the tree. The injury occurs on any part of the trunk and on any side, but is much more common on the south or southwest side, and a tree that leans to the northeast is much more liable to suffer. This is the reason that many have attributed the damage directly to the sun, and have kept in vogue the popular name. In one sense the effect of the sun is a cause of the mischief; but it may be confidently asserted that the injury now considered is in no sense a scald, produced by heat. The same thing can be artificially brought about by inoculation with blight bacteria — has been done — and the inoculations succeed as well on the north as on the south side. But the influence of the sun upon the outer bark of trees is well known to every one who has frequented the woods without a compass, and to every one else who has been sharp in his observations. The outside corky envelope, old and dead, is much more deeply cracked and furrowed on the south than on the north side, and it does not usually take long to discover if one looks, especially in early summer, that many of these cracks extend to the living cells, which are thereby exposed to the contagion of blight. So long as the bark of young trees remains smooth, and is otherwise free from wounds, we do not find this affection of the trunks. When trees lean from the sun the rays of heat fall more nearly at right angles to the surface, and are thus more effective in destroying the elasticity of the outer protecting bark. Rains, too, may more readily wash fine material into the cracks and thus in numerous cases be the means of infection. Beginning from without, it is not very uncommon for blight to be confined to the living cellular layer outside of the bast. In case the cambium layer is not invaded, new bark may be formed and the tree saved, as already said. Evidently keeping the tree erect or leaning

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to the southwest, and providing a shield of some kind, winter and summer, to protect the bark from drying and cracking, are protective measures, and they are the best we have.

We pass now to the fourth cause of injury, namely, freezing, and shall enter more into detail.

The injury due to frost, so far as the trunks of our trees are concerned, is of two kinds. In one case the wood and bark are split so as to gape open while frozen, though the crack may be closed after warm weather comes again. Sometimes only the bark thus cracks, and then there is left a more or less considerable wound, which becomes much more evident as the new layer of growth pushes out the torn edges. These cracks are much more frequent on the south or southerly side, but sometimes are otherwise located. Numerous kinds of trees are known to suffer in this way, and among others the following have, in my observation, been quite commonly cracked: apple, sweet cherry, plum, box-elder, hard maple, butternut, iron-wood (*Carpinus*), chestnut. Occasionally the black walnut, white willow, tulip poplar, several oaks and the linden have been similarly burst. No doubt the list can be greatly extended. But this form of injury is not nearly so destructive as the next to be mentioned. Trees are rarely severely checked in growth, and probably never killed through this cause alone, though the wound may be deep and long and slow to heal.

The second form of injury by frost is from the separation of the bark from the wood, occurring for the most part near the ground, and also usually most common on the side next the sun; but very often — much more so than in the former case, seen on any side or entirely around the trunk. This is the injury which has been most disastrously destructive in the apple orchards throughout a wide area of our country within recent years. It no doubt occurs in other trees, but I have seen it, since specially looking for it, only in the apple and the white willow. When only the bark cracks, as in the first form of injury, a bare strip of wood is often exposed by the shrinking of the bark and by subsequent enlargement of the trunk by growth; but this need not lead any to confound the kind of injury directly done by frost

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with that now considered. In the latter, the bark may or may not be split, usually not in any conspicuous degree; but separation from the wood is more or less complete over the affected area. Very often there is for months no external evidence of the injury, and the sickly appearance of the leaves, perhaps after mid-summer, first attracts attention. The bark itself is not always killed, and there occurs an irregular growth of wood on the inner side but separate from the older wood-layers.

The same sort of separation sometimes occurs between the annual layers of wood, and what are called "wind shakes," are often no doubt really due to frost acting in the manner now described. Sometimes these injuries take place in very old and very large trunks, but whether the splitting occurs near the surface and is afterwards thickly covered by other layers, or occurs in the heart-wood as such, is not known to me.

Having thus endeavored to describe the injuries, I now attempt an explanation, based to a considerable extent upon studies bearing directly upon the problem, but admittedly inweaving more or less of theory, and thus liable to be partially incorrect. In the first place some facts need to be stated.

Water freezes at the temperature marked by 32° in Fahrenheit's thermometer; that is, the exceedingly minute, ultramicroscopical, but solid and firm particles (molecules) composing liquid water, at this temperature arrange themselves in certain regular positions with respect to each other, and cohere so as no longer to be, as before, freely movable upon each other. What was a liquid is now a solid, though the component molecules are not in themselves changed in respect to composition or hardness. They have simply arranged themselves in regular and fixed order, like the bricks of a tower, and a crystal is the result. To attain this arrangement more or less of molecular movement is required, and anything whatever that tends to prevent this movement tends to prevent the water freezing at the temperature stated. Indeed, only pure water freezes at the degree marked on the thermometers. If a little salt or

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sugar is added, the temperature must be below 32° Fahr. for crystallization to take place; and the lower, the greater the proportion of salt or sugar. Water, saturated with salt, may be cooled down to 4° Fahr. before ice is formed. When ice is produced on such a solution, it is, as before, the arranged molecules of water which form the crystal, the foreign molecules being excluded from the structure. The ice is therefore pure water, save that impurities may be mechanically caught and held among the crystals.

Passing now to another series of facts pertaining to the structure of the solid parts of organic bodies, it may be first stated that water forms an essential part of the texture. In plants, with which we are now concerned, all the solid parts are composed of cells usually only to be seen with the microscope. These cells have walls or sack-like membranes which often enclose various substances more or less mixed with water. Sometimes the cell cavities are full of liquid water, forced up from the earth by the roots. But aside from this liquid water contained in the cells, the molecules of water help form the solid parts, as of the cell-walls. This last is perhaps difficult to comprehend, but it is exceedingly important that we should understand the fact in order to rationally acquaint ourselves with what takes place when a plant freezes. It has already been said that water is really made up of minute *solid* particles called molecules. The substance of the cell-walls, known as cellulose, is likewise composed of molecules, but of more complex structure and undoubtedly of considerably greater size than those of water. In the natural composition of the cell-wall the cellulose molecules may be represented by the bricks in masonry, and the water molecules by the grains of sand in mortar. Between these different kinds of molecules there is a strong attraction or adhesion which binds the whole into a solid substance. There is plenty of water present but no liquid. The water molecules are as truly a part of the structure as are the cellulose molecules. Ripe seeds have no liquid water in them, nothing but this water of structure, and comparatively little of that; so of the other parts of many plants in certain normal conditions of their

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existence; while, on the other hand, more than nine-tenths of the weight of rapidly growing shoots is water in both the liquid and molecular states.

Let us remember that every solid is made up of invisibly small molecules, and that these are held together by the attraction that exists one for another; that the force or effect of this attraction varies inversely as the square of the distance. This distance, at most, is so minute that any variation makes considerable, perhaps very much, difference in the result. It is this molecular attraction that binds the cellulose molecules together with the water molecules into a cell wall. The molecules, however, do not actually touch each other. Each is wondrously endowed with motion and swings back and forth in a limited path of its own, not unlike, on an infintesimal scale, the planetary bodies; kept asunder by motion, but held from farther separation by attractive force. In the living plant the swinging water molecules always separate from each other the cellulose molecules to a certain limited extent; but if by any abnormal cause the water molecules are once forced out and the cellulose molecules approach so near to each other that their own attractions are greater than that between the cellulose and the water, the latter can not get back; the organization is destroyed; the tissue fails in its physiological functions; the plant, or the injured portion of it, dies.

There is still another series of facts which, though more familiar, must be included for use in the explanations to follow. It is known to all that bodies shrink in size as the temperature decreases, and expand or swell with heat. The rails of the railway are perceptibly shorter in cold than in warm weather; the mercury in the thermometer sensitively obeys the heat changes upon the same principle. The tissues of trees form no exception to this rule. The variation in the circumference of an apple tree over four inches in diameter can be readily demonstrated by a common tape line. A box elder stick just cut, three and a half inches in diameter was found by myself to be a fourth of an inch greater in circumference between zero and plus 70° Fahr. In a large trunk the difference is much greater. It is also

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well known that water from plus 39° Fahr. to plus 32° Fahr. is an exception to the general rule, and expands as the temperature decreases from the first named degree. In the act of freezing, further expansion takes place and in both cases with, what may be designated, resistless force. Iron pipes are split like fragile reeds; the thickness of their walls constitutes no safeguard; the iron itself shrinks, the water within expands, and bursting follows. If we should bore a hole in the heart of a tree and fill it with water, exactly the same result would follow upon a decrease of temperature below 32° Fahr. A tape line would indicate a constant decrease in the size of the trunk with the decrease of temperature until relief from the enormous pressure finally came by a longitudinal split. But such splitting does not take place in living trees, no matter how much water they naturally contain, until the temperature is far below 32° Fahr. The reasons for this have already been given and reference may now be made to our salt solution; but further discussion must first give place to still another peculiarity of the freezing process of aqueous combinations.

When plant tissues, in common with other things, containing water in a state of molecular association with other molecules, are subjected to certain low degrees of temperature, the outside or exterior water molecules first freeze or arrange themselves to form a crystal. The temperature at which this takes place depends upon the molecular attractions. When the amount of water is sufficient to fill the molecular interspaces to saturation, the crystal begins to form at very little below 32° Fahr.; but when the proportion is much smaller than suffices to equalize the attraction for the water molecules, the crystalline arrangement of the latter begins at the surface of the organic structure only, and at a much lower temperature. If a limb is cut from a living tree, hardy in our climate, when the temperature is at zero, and has not immediately preceding been much lower, neither the bark nor the wood will ordinarily be found frozen. A separated sliver is still flexible, and no ice crystals can be seen with the microscope; but a drop of water applied to the surface, even soon after the stick has been

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taken into a warm room, instantly congeals as it does on similarly cold iron. Yet in this green stick there is forty per cent. of its weight water, existing there unfrozen at zero, Fahr., not as a liquid, but capable of being evaporated from the tissues at the temperature of boiling water.

When this water does freeze in some of our trees, at about —12° to —20° Fahr., a minute thin plate is first formed on the surface of the structure, or rather multitudes of such thin plates of regular shapes, are thus formed near together. With a little further decrease of temperature, other water molecules, are wrested from their attractions in the woody structure and arrange themselves beneath those first formed, and in so doing push the latter outward. This escape of some of the water from among the cellulose molecules causes the latter to approach nearer each other, and at the same time to hold with stronger power the remaining water molecules which only join their fellows in the crystal at a still lower temperature. As, however, the cold increases, the crystal pushes out, not gaining in diameter, but increasing in length by constant additions to its base, just as we may conceive of the erection of a chimney by successively placing bricks under those already laid and pushing upward the whole structure. The final length of crystal depends upon the amount of water and the degree of cold. Sometimes frozen succulent plants may be seen thickly coated with a crust of such crystals a fourth of an inch or more long, but so slender that a magnifier is needed to identify invidual ones, the whole presenting to the naked eye a somewhat velvety appearance. Similar crusts are formed in the interior of the tissues on the surfaces of certain kinds of cells and pushing into cavities caused by the shrinking of the material.

We may now consider that we have the chief facts upon which the explanation of the two forms of injury to tree trunks by freezing rests. We have compared the splitting of the trunks to the familiar bursting — too familiar — of iron water-pipes and water pitchers. It is only necessary that a sufficient amount of water in the liquid state exists in the central parts of the tree, and that a sufficient degree

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of cold can be reached, to shrink the woody fiber and congeal the fluid. If the water, though as a liquid in the ducts, cell-cavities and intercellular spaces, contains substances in solution like sugar, earthy salts, etc., freezing will be more or less below 32° Fahr.; and this is normally the case. If the water exists only in the imbibed state in the cell-walls, a much lower degree than this will be required to produce crystallization, and this is the normal winter state of a hardy and sound tree. It is only in spring-time, or in a spring condition of things, that any liquid water exists in such trees. On microscopic examination in winter no water as such can be found in the cell-cavities or other openings of the living tissues; yet by heat under 212° Fahr., forty per cent. by weight of water can be driven off. It is molecularly distributed among the elementary bodies of cellulose, protoplasm, starch, etc., all of which are much too minute to be seen with our best microscopes, but which as certainly exist as do worlds beyond the reach of telescopes, and both are as certain as human knowledge at its best.

I append a table of the proportions of water determined by evaporation in an oven kept below 212° Fahr., in the trunks of several trees cut in December, 1883. Where two numbers are given in a column the first shows the water in the inner portion, and the second in the succeeding ring of growth:

Trees.	Diam. In.	Per cent. of Water Heart.		Per cent. of Water Sap.	
Hewes' Virginia Crab, No. 1..	4		43.05	44.67	
Hewes' Virginia Crab, No. 2..	4	42.29		42.75	
Wilson's Sweet.....	6	44.30	46.00	42.30	43.80
Box Elder.....	4	41.92			40.85
Box Elder.....	5	41.18			41.36
Box Elder..... ..	8		33.48	38.18	
Soft Maple.....	4		45.35	38.95	

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In the spring some of these trees would contain a greater per cent. of water, but I have no figures for amount. What has now been given may be a surprise to many, and the query would hardly be unnatural, "Why do not all the tree trunks burst when exposed to a freezing temperature?" If, however, the internal wood is sound — rotten wood soaks up great quantities of water — and the spring activities of the roots have not commenced, it is not likely that the trunks of any trees will burst by the swelling of ice formation. Whether or not the shrinking of the tissues by cold without concurrent freezing is with us ever sufficient to cause the longitudinal cracks we observe after the manner of shrinking by drying, I can not tell. Probably the bark may sometimes part through this cause. The tendency to such cracking by the change in size as the temperature decreases is just as certain as by the change through drying by heat. The only question is as to the amount of contraction by such cold as we have. Probably no trees ever burst until the thermometer marks zero or below, and then only when the heart is more or less rotten, or after the roots have started to absorb quantities of water from the soil, as in springtime.

But this cracking open of the bark, or the latter and the wood, does comparatively little injury. It simply makes a bad wound without otherwise in the least destroying the vitality or healthfulness of the tree. I shall, therefore, only add an explanation of the crack so commonly occurring on the south side or that most exposed to the sun. If this splitting of the trunk can be properly compared to the bursting of a water pipe, how can it be that the points of the compass have anything to do with it? The rupture of an iron tube always occurs in the weakest place, and no amount of thawing and freezing on one side, with the other less subject to such changes, can make any difference in the result. Action and reaction are equal, pressure southward means equal pressure northward, and so of east and west. Now so far as the outer layer of bark is concerned the south side is the weakest, because of the drying effects of the sun; cracks always being more numerous here than elsewhere, and

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this difference in strength, slight as it is, should be sufficient to cause the southern crack, if all other parts were exactly equal. There is, however, a far more effective cause for the phenomenon. Every change in the temperature of the tissues of a tree affects the quantity of water in the cells and intercellular spaces. Indeed it is largely by such alternating changes of heat and cold that liquid water gets into and accumulates in the trunk of a tree, mainly through the contraction and expansion of contained air. The corky bark is almost impervious to water and air, and forms a kind of sealed tube whose lower end only is open in winter. If air at first occupies all the cavities in the wood, as it does in summer, and a reduction of temperature occurs, this air very considerably contracts in volume, making a vacuum, or would do so were they not concurrently filled by the upward flow of air and water from the roots, and through them from the soil. When the air again expands pressure is produced, and, gases being more mobile than liquids, the air rather than the water is forced down or in any other direction, leaving another condensation by cold to act as before. In this way the tissues of the south side of an exposed trunk of apple or other trees gains more fluid than those of the north side. The increase of water and the consequent dilution of the dissolved substances causes earlier and greater congealing and its effects. I sumit the following figures obtained by Mr. Hewes, a student of the Illinois Industrial University, in April, 1883, from experiments upon a soft maple (*Acer dasycarpum*) about forty feet high and nearly one foot in diameter of trunk:

No of Observation.	Specific Grav.	Per cent. of Sugar.	Am't of Liquid.
10	N 1.013	3.3341	
	S 1.011	2.6485	
11	N 1.012	3.2279	
	S 1.008	2.0004	
12	N 1.011	2.9569	
	S 1.0088	2.2731	
13	N 1.006	4.4967	
	S 1.006	3.5150	

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If the south side of the trunk is well shielded from the sun, splitting may occur, and then on any side; but the injury would not be so liable to happen. The condition of the heart of the tree must be an important item in the effect, but the last season's growth, whether vigorous or not, makes little difference.

Passing now to the much more serious injury — the separation of bark and wood — we may say that neither the swelling of the interior nor the shrinking of the exterior layers of tissues can be accredited with the disastrous results, for these crowd the parts together instead of forcing them asunder in a radial direction. Neither is it in any way the undue shrinking of the interior and extension of the outer portions, because no such thing occurs. The heart of a tree always freezes first. No change of temperature is sudden enough in the open air to cause the bark and younger wood to freeze before the pure water of the heart wood congeals, popular opinion to the contrary notwithstanding. The very heart of a healthy tree has more water in it, susceptible of freezing, than has the sapwood and bark, and, if vitality counts for anything, its influence retards the freezing of the outer rather than the inner parts of a tree. During the present winter an excellent opportunity has been offered for observations on this point. When the thermometer first reached zero in December, I examined the twigs of many kinds of trees without finding any of them stiffened with ice, except the very immature water sprouts of apple trees and the tall growths of the tender catalpa. The same was true at — 6°. At — 12° the pith of some last season's growths was hard and rigid, and ice was readily seen with a hand magnifier. This was observed in apparently fairly ripened twigs of pear — Bartlett and an unknown variety,— of some apple trees, of several raspberries, including Turner and Mammoth Cluster, of some shoots of Concord grape (not of those best ripened), of hybrid perpetual roses, etc. On the other hand, the wood and the bark of all these, except water shoots, were still flexible and without ice, while the twigs of most trees, as a whole, were unaffected by ice. At — 28° in a considerable number of in-

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stances, the twigs and the separated wood snapped like icicles, and were found, more or less, crowded with ice crystals; yet, in a greater number of cases, the living parts were still flexible and tough. In very few species was the living mature bark, during the coldest period, found frozen — never in ripened apple limbs,— and these are accounted somewhat tender kinds, such as tulip poplar, the magnolias, various roses, peaches, raspberries, etc. The May cherry twigs have at no time during the winter been brittle by freezing.

It is, however, essentially certain that the bark of apple trees has been forced off by frost, the formation of ice in or near the cambium layer. It has not been my fortune to actually observe the phenomenon for the purpose of verifying the conclusions otherwise reached; it is difficult to find the affected trees or areas until long after the injury is done and the operating cause removed, and no artificial experiments have been tried. I venture, however, the assertion, that it is the growth of the forest of ice crystals from imbibed or molecular water heretofore described, together with the consequent shrinking of the tissues, that pushes off the bark, with or without a radial, longitudinal split. Such a crystalline growth does take place in the tissues of plants, and is readily seen by microscopical examinations of frozen succulent stems. The cause is amply sufficient for the result, and the only point upon which to hesitate is: Does this kind of ice formation really occur in the tissues between the bark and wood of the apple trees? We may positively say that, under the usual favorable condition of things in our climate, it does not. It can not readily be found this year after a temperature of —28° Fahr. But, after all, may not the phenomenon occur under certain and peculiar circumstances or combinations of circumstances?

Having pretty well examined the problem, from what the courts call circumstantial evidence, I submit the following as the chief factors in the combination of causes leading to the unwelcome result: If, in mid-summer, a severe drouth occurs, the tree is checked in its growth so far that the stimulating influences of a warm, moist, spring-like autumn

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start afresh the activity of the cambium cells, and if growth of new cells does or does not occur — usually it does — in the cambium of apple trees, though shoots start, the solution of the stored materials and undue absorption of water puts the tissue in condition to freeze in the manner mentioned, when exceptional cold follows in winter. The more severe the drouth the more likelihood of such an autumn spring-like start. Florists know very well that to cause a plant to grow out of its season, nothing so prepares is as a preceding rest, brought about by withholding water. Without such rest the same stimulating influences will not operate. In its normal season maturation may result instead of new growth, under the attempts to secure the latter. There can be no doubt but that apple trees are more or less checked, in many situations, by the want of water during the dry times of July and August, and more in some soils and situations than others. Neither can there be any doubt of a responsive activity to the effects of a warm and wet autumn. The buds swell and burst into shoots or flowers in many cases, and in the southern latitudes of Illinois are sometimes very conspicuously developed. With a corresponding activity of the cambium and a subsequent hard freeze, it is little wonder that damage is done.

The evil consequence then, of the summer's drouth, is what we should in the first place strive to avoid. This may be accomplished in several ways known to us all, and I may only mention such as the choice of site, deep drainage to favor the penetration of roots into soil likely to be moist in summer, good surface cultivation during dry times, extensive mulching, and the selection of varieties possessing powers of withstanding drouth. Of these only the first will be further discussed.

In my own region of country, Central Illinois, I have been greatly struck with the comparative healthfulness of apple orchards on the flat lands, while upon the high ridges, usually most esteemed for fruit trees, decided unhealthfulness is the rule. In view of the foregoing, is it not probable that an improper choice of location has very often been made for the orchard? It can not be said that the highest

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lands are always most susceptible to drouth, but this is generally true in the region mentioned. The soil of the lower grounds is richer, at least in partially decomposed vegetable matter, and this aids greatly the retention of moisture. For other reasons one would not choose for an orchard site a place relatively very low; but there is much difference between flat land and low land. Certainly no one would select a slough as the most suitable for orchard fruit. Too much water at other times of the year is as bad as too little in summer. Land that is, however, too wet, may be so improved by tile draining that it may become the very best for apple trees, being rich and light, with no standing water, but moist enough at all times for the healthful development of orchard trees.

The apple crop, in 1883, in Champaign and adjoining counties, was very good, thousands of bushels of fine fruit being gathered; but the difference in orchards differing only in the nature of the site, and as far as could be made out, in the relations concerning water, was very remarkable. Nearly all the apples worth anything came from land having very little slope and which, though not usually drained, would be much benefited thereby. A few orchards on the higher ridges were abundantly productive, doubtless due to the peculiarities of soil and subsoil, while by far a greater number so situated produced nothing fit for market. The attention of those who contemplate planting trees has been forcibly drawn to the subject and the old ideas concerning selection of site have been thoroughly overhauled. Doubtless mistakes will yet be made, and possibly now on the opposite side from those of previous years. We shall do well to remember that it is the excessive dryness of the soil in summer that is to be avoided, not necessarily the highest grounds. — Professor Burrill, in *Trans. Miss. Vall. Hort. Soc.*

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HOW I DID IT.

My experience in horticulture is not very extensive; and may not be interesting, and my conclusions may be ridiculed by scientific men. But as long as I am successful, just so long I shall be fool enough to keep on blundering in the course I have begun. It makes no difference whether an apple is raised scientifically, or naturally; the fruit is what we are after. If that is satisfactory, and the supply is likely to hold out, that is all we hanker after.

Wise men err, some of us know that by experience, and fools sometimes blunder in the right direction. It is often hard to know which are the fools, and which are the other class. The wisdom of to-day may be folly long before the next generation get through cutting teeth. We laugh at many of the theories of our ancestors, and our children will make fun of their fathers'. This is emphatically so in matters relating to horticulture. The failures of the last twenty-five years have taught us the folly of scientific theories, and made us rely more on our own experience. No matter if we cannot tell why a thing is a success, it is the how that we are after. What is a success with me may not do for my neighbor with a different soil and location, hence the necessity of exercising a little common sense in the matter.

That was what ailed the pioneer fruit raisers (?) of Wisconsin. We tried to raise the same varieties of apples grown successfully upon the old homesteads in the far east. Our choice of location, manner of setting out, and after-culture were the same. And how we wondered at our repeated failures! The books told us we were right; that it was not we that were blundering. We came to the conclusion that it was all in the confounded climate, and we were a set of fools to waste our time and money any further. Apples never could be raised in Wisconsin, unless it was the toughest kind of crabs. Many a disappointed horticulturist got permanently disgusted, and, to this day, puts his faith only in Siberians.

It took years of patience, it took experience, it took common sense to make our people believe that Wisconsin is yet

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to be — is now — one of the best fruit growing states in the great northwest.

In apples, some of our Badger seedlings will lose nothing by comparison with any, and our grapes can not be beaten in flavor, size and productiveness.

Some croakers tell us that we are yet doomed to disappointment; that some of these hard winters will freeze the vitality all out of our cherished trees, and leave us nothing but blasted hopes. It may be so; but no mattter, we will enjoy the fun while it lasts.

My first attempt at an orchard in Wisconsin was over twenty years ago, and proved a "fizzle." But I learned that the R. I. Greening, Baldwin, and such eastern favorites had better be let alone. I next tried native seedlings, thinking, of course, that they must be hardy. But about the time they got to bearing, they left me, and their memory is anything but pleasant. I then got discouraged, and gave up horticulture as a bad job, and tried to adapt my taste to our seedling crabs. Then I wanted to move, O, so bad! If I could only sell out, how quick I would go where apples and cider were cheap, and grapes plenty. But I could not sell, and was obliged to stay; and now I don't want to leave, for I have learned that we can raise cheap apples and cheaper grapes, even in this latitude.

A few years ago I bought of friend Springer a lot of roo grafts, and put out a small nursery, just for my own convenience. The most of them proved to be kinds not popular now, but they made me some splendid stocks to graft better kinds upon. My way is this: In the spring I saw off what I want to use, just above the crown, and graft into the stumps; the next spring I take them up, and set in the orchard.

My land slopes gently towards the east and southeast, well protected on all sides, a clayey loam with a red clay subsoil. In starting, I plowed as deep as convenient, then cross-plowed, turning the back furrows just sixteen feet apart (I think twenty feet would be better) — the distance between the rows of my trees. I placed my trees along the back furrows, digging only as deep as I had plowed. When I got a hole

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dug I went to the nursery, took up a tree and *at once* set it, being careful to get it in the same position that it occupied in the nursery in regard to the points of compass. If the hole was not deep enough I hilled it up, so as to have it, when the dirt got settled, no deeper than its original bed. The top being small, required no trimming, and my trees had nothing to do but go ahead, and they have kept doing so ever since. They are just coming into bearing, and I challenge the county to show thriftier young trees than mine. I believe in low tops, and have trained mine accordingly. In setting I find great advantage in giving the trees a little southwesterly slope; they will come up straight enough, and many will be a little too straight. Every fall just before winter, I bank up my trees with dirt, to be taken away in the spring. It serves as a protection from the mice and also from injury through freezing and thawing.

I have cultivated the land, so far, but mean the coming season to seed to clover, as the tops of my trees are getting too large to work among them safely with a team. I shall take one crop of hay off early, and let the second crop go back to seed and enrich the land, and give the ground a mulching.—J. Wakefield, in *Western Farmer*.

NOTES ON APPLES.

Mr. G. F. Lewis, of Omro, Wis., writes, that in his locality the varieties that succeed best are Duchess, Ben Davis, Walbridge, Pewaukee, Golden Russet, Willow Twig, Utter, Tallman Sweet and Red Astrachan; on clay soil, well underdrained, facing the east and south.

Mr. O. B. Barber, a lawyer and practical farmer, of Tomah, Wis., reports for a number of towns in his county, saying that most of the hardy standard varieties do well in that portion of our state on a northern slope, with clay resting on a gravel subsoil.

C. E. Fry, of Bloomfield, Iowa, says that most of our standard varieties succeed well on northern slopes with good clay soil.

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Mr. N. Johnson, of Mount Pleasant, Iowa, writes: "I have 800 bearing trees, of 100 varieties, which is seventy-five too many. Among those which succeed best are Ben Davis, Wealthy, Fameuse, Grimes' Golden, Maiden Blush, White Winter Pippin and Willow Twig; on northeast or southwest slope, with good clay soil, well under-drained. I would advise to plant only iron clad trees; trim sparingly, and protect on the south and west with belt of timber."

Mr. J. E. Adams, of Paris, Edgar county, Ill., says that in his locality they have the best success with Early Red June, Early White Wine Sap, Yellow Harvest, Red Astrachan and Romanite; prefers limestone land, but Red Astrachan prefers black prairie soil. In my own orchard, on rich clay soil sloping to the north, I find Ben Davis, Tallman Sweet, Bell Flower, Golden Russet, Jonathan, Fameuse, Plumb's Cider, Walbridge and Red Astrachan, all to succeed well.

Now, these are localities widely extended, but in varieties quite a unanimity of expression as to hardiness and location of the orchard, with soil best for good results. In many localities the blight or scab is quite a drawback to perfect fruit. The inducing cause of this, and a remedy, is a study for the naturalist and scientist, and he who shall find a sure and easy remedy will confer a favor on all fruit-growers. Now, if anyone asks what we shall plant, my answer will be to plant of the varieties that succeed best in your locality, soil and exposure being equal. But this is not all, for if you will raise apples for the market they must be of such varieties as will sell well and keep well; and so of summer and fall apples; unless you are sure of a near market, plant sparingly. And then again, some of the hardy winter varieties, like the Walbridge, are small and of poor color, and though a better apple than the Ben Davis, yet of this variety you could sell ten barrels as easy as one of the Walbridge, because it is larger and more showy. The Jonathan I consider one of our best winter apples; in color a perfect beauty, and quality superior to anything that grows in Wisconsin, and though not considered extra hardy, I find my own trees do as well as any on my grounds. It is another mistake to suppose that you want a hundred varieties, when

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a dozen or so of the best for your locality, either for market or home varieties, would be preferable. I cannot close this already too long article without saying that eternal vigilance is the price of a good orchard. So do not buy good trees and then think they will take care of themselves after you have planted them out.— B. S. Hoxie, in *Western Farmer*, 1882.

FRUIT PROSPECTS.

On the fourteenth day of May I issued a circular letter to the members of the state society, and to others in the Northwest who are interested in fruit growing, making inquiries relating to the condition of fruit trees and small fruits.

And from a very general response I am able to give a condensed report. Section three of the act of reorganization says: "It shall be the duty of said society to aid in the formation and maintenance of county and local horticultural societies; to promote the horticultural interests of the state, by the holding of meetings for discussion, by the collection and dissemination of valuable information in regard to the cultivation of fruits, flowers and trees adapted to our soil and climate, and in every proper way to advance the fruit and tree growing interests of the state."

The severity of the past winter has made me solicitous to know more of our iron clad varieties, if, indeed, we have any that can lay claim to that title. The list of eight varieties best adapted to Wisconsin; hardiness, productiveness and quality taken into consideration, are Duchess, Wealthy, Fameuse, Pewaukee, Plumb's Cider Walbridge, Tallman Sweet and Wolf River. Most of the reports say that the above list is all right, and all speak of the Duchess and Wealthy as being iron clad. There are orchards and isolated trees of the Duchess, which were planted out more than thirty years ago which are now vigorous and healthy.

In response to my letter to Mr. Webb of your paper, he replied that "This variety so far appears to be a complete success in this section." And let me say right here this is

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not a crab variety as many suppose. The Wealthy, though a later variety, promises to be everywhere in the Northwest just as hardy. This variety, as many of your readers know, is a native of Minnesota, and originated with Peter M. Gideon, from seed sent to him from Bangor, Me., some twenty years ago; and it was very fitting in him for such a beautiful fruit, to give it the name of his wife, Wealthy.

The Wolf River, though not so widely disseminated, will be generally sought after for its size and beauty and perfect hardiness in many localities. It was this variety which gained such notoriety in the New Orleans exhibit. In southern and southwestern Wisconsin some other varieties than these mentioned succeed well, and came out all right this spring, as for instance Roman Stem, Golden Russet, Fall Orange, Willow Twig and Red Astrachan. The most of all these varieties promise a good crop this year.

Of small fruits the reports are not so favorable. Blackberries of all varieties, not protected, were generally killed down to the snow line. Raspberries, not quite so bad. Strawberries, whether protected or not, are in good condition; the covering of snow was quite sufficient. Grapes that were protected are looking well, those not protected are badly damaged. J. M. Smith, of Green Bay, writes that he lays down and gives a light mulch of dirt and marsh hay to all small fruits, and this spring everything is looking fine.

It will be noticed that we have a lot of good varieties of pples that can be depended upon in our varying soil and climate, while other choice varieties succeed well in many localities. We have other new varieties of seedlings and late importations from Russia, that give promise that they can be classed among the iron clads.

These facts should be borne in mind in setting out new orchards, either for home use or for market. All of the new varieties of crab apples succeed well in all places in the Northwest; and at some points near Milwaukee and Green Bay, the more hardy varieties of pears are looking well and promise a fair crop, but it is not safe to put much dependence on this fickle fruit in our climate. Another fact must be learned; that to succeed with that most delicious

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fruit, the blackberry, the canes must have some winter protection, and no market gardener can afford to lose a crop by this neglect. The lessons of the past winter are well, if they be heeded by the fruit grower, whether he be growing for his own use or for the market.

To one and all my thanks are due for their timely reports. —B. S. HOXIE, Cor. Sec. Wis. Hort. Society, in *Northwestern Farmer.*

Evansville. Wis., June 2, 1885.

RUSSIAN APPLES.

I am able to make only a partial report on Russian apples, although I have been at work and investigating the subject for some fifteen years past. We have some Russian varieties that we think are all right. I exhibited at our state fair this last fall sixty varieties of Russian apples and we made a very good show so far as that is concerned; many of them were large and showy apples. I have the Longfield and I have been of the opinion that the fruits brought from that portion of Russia, off northeast of Moscow, would be perfectly adapted to the prairie regions of the Northwest; and from my experience with these fruits I have not yet lost faith that that will be the case.

I have not seen anything, among over a hundred varieties that I have in orchard — I have not seen anything so far as the wintering is concerned, that is hardier than the Wealthy so far as the tests I have made go. And I consider the Wealthy as hardy as anything that has originated in our state.

The country from which these Russian varieties come is very similar to this; it is a great prairie country a thousand miles in extent — a rich prairie country many portions of it. There are orchards there situated in what we would consider very unfavorable localities, on deep, black soil; but they are successful, and in those orchards they have been growing fruit for hundreds of years. I thought myself, at the start, that we never should be able to find anything

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among the Russian apples that would keep, from the fact that the trees there were grown so much further north than here, and it is a so much colder country that the apples that were there winter apples would become fall apples here. But we have fruited some that were good keepers, some that will keep nearly to the time of the season of new apples, so that idea has been dissipated. We are going to have a fair number of late-keeping Russian apples. For summer we have an early apple and a better apple than anything else that I have ever grown for an early apple; that is, considering the quality and its appearance for the market; I do not think we have an apple that is equal to it, as an early apple. It is longer in season than any early apple I have ever known. My apples get ripe about the 25th of July. I had some at our state fair that had been lying on a shelf in an upper room until the time of the fair and that were in good condition. This apple, so far as quality is concerned, is about like the Early Harvest; I think it is a better apple. The tree seems to be perfectly hardy and is a very early bearer; have had the tree bear when only three years old from the graft; it is a very desirable tree for early fruit. Then we have another hardy apple that is better in quality—in fact we have nothing better so far as quality is concerned except the Early June. It would not be a good market apple because it scabs somewhat, but it is of very fine quality; the tree is very hardy.

There seems to be a peculiarity that these trees come in sorts of classes. There is the Alexander class. There are several apples of that class, all subject to blight, every one; the Tetofsky, and six or seven of that class of apples have the same peculiarity. There are others more showy than the Alexander, some of them that are striped and quite large; these apples are subject quite as much to blight as the Alexander; but as the trees get older they do not show the blight so much. Then we have a class of apples of the Anis family, and there are several varieties. How valuable they are going to be I am not prepared to give an opinion. The tree is said to be perfectly hardy, said to be the most hardy of the Russian fruits. There is quite a

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difference in the varieties belonging to the Anis family, as regards the quality of the fruit. We have one known as the Anisette, which is almost if not quite the Duchess; it is very similar to the Duchess; the tree looks very much like a Duchess. We have also the Red Anis and Yellow Anis; I cannot see any difference between the red and yellow. These are among the five varieties found by Mr. Budd in Russia.

We have another apple that we have tested enough so that we are willing to put confidence in it, and that is the Longfield. I don't know of any of the Russian varieties that is perhaps more valuable to plant. I have fruited it for five years in succession and raised a crop every year. I have the apple here. It is an apple of good quality, and I think fully as good as the Fameuse; and I think it is a better keeper; my apples have not rotted as much as the Fameuse. Dr. Regel says of the tree that in an orchard of over a hundred varieties it is the only apple that would bear every year. With me it has fruited, as I say, every year for five years, each year increasing its crop; and I had trees this year the most heavily laden with fruit that I have ever seen. Here is a specimen of the Longfield. Here is an apple that is a great keeper. That tree is a great bearer, and I think the fruit will keep till June.

I have another apple that came to me under the name of Lord apple that is much like this one in appearance and is a little more acid, rather sharp acid, fine grained, and a very good keeper. I think it is going to be a valuable tree for a late keeping apple. It is a good bearer. I neglected to gather the fruit on that tree until the last of October. I was told by a neighbor that he saw a person carrying fruit from my orchard, and had seen him making two or three trips. I examined and found no fruit left except a few specimens I found in the grass; these are the ones. That is a late keeper, probably as late as any I have.

I would say that these apples were on exhibition at the county and state fairs. I put them in a box and they were there until two weeks ago when I went and picked them out.

I have no question in my own mind, from what I can see

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and from my experiments with these Russian fruits, that they are going to be adapted to this whole prairie region, clear up to Manitoba. Trees have been doing well with me the past five years. Some of my trees set three years ago have been fruiting some, and have come through these hard winters in perfect condition. I can see no reason why these apples, coming from a country much further north than ours, and with conditions very much like ours, should not be adapted to the climate here. There are no orchards on this continent that will compare in extent with the orchards which are to be found in Russia. The whole business of a considerable portion of this country seems to be the growing of fruit in an open prairie country, and it is a business that is successful. The Volga answers to the Mississippi and the Missouri here; it drains a great prairie country, a rich prairie country, and these apples grown on the Upper Volga are transported to Palestine and Southern Russia, and there they find their market. The people living in Palestine get their apples from Russia. Mr. Gibb tells me that they told him there that in their mildest winters the thermometer ranged lower than it does here this winter, and that without a particle of snow on the ground the trees were preserved.

It will take some time yet to try and determine the value of these Russian apples. I have some fifty varieties that I have not fruited yet; I fruited some sixty last season and we expect to find something among them that will be of value; have already found something that I know will be of value to this whole northwestern country.

I have not come here to represent a nursery; I come here as a fruit grower. My business has been fruit-growing for more than thirty years; I try to throw aside my nursery business whenever I go into a convention to talk fruit. My orders for these trees are fifty times what I am able to supply; I don't take one order in fifty. I am not here to recommend any fruit for the purpose of sale. I have already had too much notoriety on this Russian apple business through your reports and that of Iowa, and the report of Mr. Gibb, of Canada.

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Col. Stevens.— Have you raised the Russian Transparent?

Mr. Tuttle.— Yes, sir; it is the early apple I was speaking of. I think there is some variation in this class of apples. Take the White Transparent and the Yellow Transparent, I can see no difference in the fruit. Whatever else we may find for an early apple among the Russians, I do not expect to find anything better than that. It will be the early apple not only in the Arctic regions but here as well.

Mr. Smith — I would like to inquire about No. 190, known as the Tiesenhausen.

Mr. Tuttle — It is a late keeper; it is of good quality and in form like the Ben Davis. Prof. Budd, when he returned from Europe, gave out the idea that the apples that I had were not the true Russian apples, but were German and coast apples. Well, I happened to have pretty much all the kinds he mentioned and among the varieties I have are the five varieties of the Anis. I have taken pains to get the best, and Mr. Gibb, of Quebec, says, after looking over my orchard and examining my Russian apples in my orchard, that I have nearly every variety of value. At that time he held out the idea that my apples were not adapted to Minnesota; but I guess, perhaps, he has now given that up. I have had a little controversy with him. The fact of the matter is that Dr. Reed, in collecting those fruits for the United States, did very thorough work, and he selected apples which were grown throughout the whole of Russia.

Mr. Sias — I would inquire if you have fruited the Red Black?

Mr. Tuttle — No, sir; I have not.

Mr. Sias — I have a specimen here I would like to show you.

Mr. Tuttle — I would like to say a word about the Repka, on account of its late keeping, a variety which Messrs. Ellwanger and Barry highly recommend. With me it is a late keeper and seems to be of very great value. My trees stand on June-grass sod and have stood there for five or six years, but have borne every year; the past year they bore a very heavy crop.

I wish to say here that I would rather be the originator of

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the Wealthy apple than to hold the highest office in this state. It has done more for the Wisconsin Horticultural Society than anything that has ever been done.

Mr. Smith — Is it not your opinion that these seedlings show better characteristics as to shipping and keeping qualities than the average of the Russians?

Mr. Tuttle — I do not think that a promiscuous lot of seedlings would show equal keeping qualities. We have very few Russian varieties that are not better keepers than the Duchess. According to one authority the Longfield will keep as well as the Snow apple, and we call the Snow apple, pretty good.

Now, I am not advertising these apples myself; in fact many of these new kinds I haven't got in the nursery at all, that is, I have none for sale. Until Mr. Gibb came to my place there were several kinds I didn't know anything about. There are men who are traveling through the country selling Russian apples and it is a credit to their business, but there are lots of things that are sold that are not Russian. The Pewaukee is sometimes sold as a Russian apple, and the Waldron. They come here and sell them, but I have not seen any of these men traveling and selling Russian apples that were selling a list of strictly Russian apples. They send out the Lord apple when it is nothing more than the Alexander.

Mr. Sias — I have fruited about fifty varieties of these new Russians and I fully agree with Mr. Tuttle on that point raised by Mr. Smith, as to whether they average as well as the seedlings. I think the Russian varieties average much better; that is, as to quality and hardiness as compared with the seedlings. Now, I am on the seedling committee and don't wish to say anything out of the way in regard to the seedlings, for I believe in the seedlings, but facts are what we are to get at. The Russians are hardy and they average much better than a lot of seedlings such as are generally to be found through the country.

Mr. Tuttle — Mr. Dodge says he did not find the true Duchess in Russia. The Red Anisette, the Yellow and the

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Green Russian are so near alike that one has difficulty to distinguish between them; and yet I can see a little difference. They are Duchess in tree and Duchess in fruit.—A. G. Tuttle, in *Report Minnesota Horticultural Society.*

THE FUTURE OF ORCHARDING IN THE PRAIRIE STATES.

The apple, pear, cherry, and most of our plums, are not native to our continent, and their introduction into the states west of the great American lakes has not been guided by the scientific skill in selection which characterizes such work in the colonies of all the civilized governments of Europe.

Without exception, the scientific observers connected with the early surveys of the illimitable prairies of the west, interpreted the absence of the Conifers, the Rhododendrons, the Mosses and all the characteristic trees and plants of the more equable regions nearer the coast and lakes, to mean an inter-continental climate of extreme changes in temperature and humidity.

In these early days of prairie settlement, such men as Judge Knapp, Dr. John A. Kennicott, Robert Russell and J. G. Cooper, unitedly expressed the opinion that the world had no counterpart of our plains in soil and climate, except the great plain which covers, like a blanket, fully three fourths of Europe on the northeast.

These men, in connection with Arthur Bryant, Hon. G. P. Marsh and many others, also predicted, in those early days, that unless systematic timber planting was commenced and carried forward to offset the destruction of the dense growth of prairie grass, and the effects of opening the clogged drainage centers of the primitive prairies, consequent upon occupation and cultivation, the already fickle and extreme climate would change for the worse as the years went on.

With such clearly expressed views as to the nature of our climate, it would seem passing strange to the people of

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Europe, so long accustomed to well-equipped and endowed experimental stations, that we have never attempted to row our own horticultural boat; but have permitted the nurseries of the eastern states to do our importing of trees and shrubs from the mildest portions of southern Europe, mainly indeed, from the nurseries of Thomas Rivers, in England, and André Leroy, in southern France. Our plan really has been to try everything which our eastern friends had to offer, and hold fast to that which was good. Unfortunately for our interests, southern Europe has very few varieties of the fruits which will long survive in our climate, and the very few we have received are really strays from the east plain of Europe, or seedlings grown on our own soil. As instances of real iron-clads over broad expanses of our prairies, all will think of the Duchess, Gros Pomier, Fameuse, Drap d'Or and Wealthy — all but one strays from the east plains, and that one, beyond doubt, a seedling of Duchess or Tetofsky.

Of pears, we have not one true iron-clad, and the nearest we have — the Besi de la Motte and Flemish Beauty — are from Poland, on the borders of the east plain, but modified by the breath of the gulf stream.

With the cherries we are quite as unfortunate. The Dukes and Bigarreaus of the east utterly fail with us, and the early and late Kentish and English Morello, in addition to short life of tree and irregularity of bearing, are far lower in quality than any one of the Griottes grown by the train loads on the plains north of the Carpathians. As to plums — without thanks to our eastern friends or to south Europe, we have been more fortunate, as nature has provided us with better native varieties than I know to exist elsewhere.

Beyond doubt we have lost millions of dollars and an untold amount of time and faith, in unsystematic trial of fruits adapted to more equable climes. Surely the time has come when we should unitedly give trial to fruits of like climates, so far as they are commercially obtainable. Perhaps ultimately our favorite fruits will be seedlings of those we first introduce, but the only safe line of experimentation is based on the assumption that the future favorites of our

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orchards of the apple, pear and cherry, will come from climates fully as severe as ours, or will be seedlings of such varieties grown on our own soil.

With the hope of aiding in this systematic experiment work so much needed, I will offer a few suggestions based on a careful study of the climate, soil and fruits of intercontinental Europe in the summer of 1882. These hints are formulated on the well-known fact that every part of the Mississippi basin is subject to extreme summer and winter variations of temperature and humidity of air, consequent upon the varying winds, and that mere ability to endure a very low temperature, is the only requisite needed at the north which in the south part of the basin may be dispensed with.

Southern Illinois, Missouri and Kansas may safely experiment with apples, pears, cherries, plums, apricots, nuts, ornamental trees, and shrubs of the plains of northeastern Austria for the western portion, and of Transylvania for the eastern portion. Here are found late keeping varieties of the apple, comparing favorably in size, beauty and quality with the best we know, growing on trees with foliage as perfectly adapted to a varying air as our Duchess. Here also are found many varieties of the pear with the perfect foliage of the Chinese Sand Pear, yet producing fruit nearly equal to the best sorts of France and Belgium. We have the less reason to believe they will be subject to blight to a serious extent, as for ages they have been subject to intercontinental extremes like those of our valley.

In this region will, in like manner, be found the coming cherries for the dry belt where the extreme winter temperature does not reach lower than from fifteen to twenty degrees below zero.

The plains of Galicia are checkered with lines of cherry trees along the sides of all highways, and marking the division lines of estates, to an extent not found in many parts of Europe. The varieties too, are all new to an American. A careful study of their leaf structure, fruit, habits of growth, etc., will convince the most skeptical that we have gone sadly astray in selecting fruits for an interior prairie cli-

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mate. The Griottes, with small pendulous branches, and fruit with colored juice, are generally used for roadside planting, as the trees do little shading on account of their small size, and the fruit can be used for dessert, culinary purposes, and for the favorite drink of high and low, known as "Kirschwasser." In every respect the fruit is far superior to our Kentish cherry, or any one of the Morello type we know. In the fruit orchards, and on the grounds of land proprietors, we find many varieties of a race of sweet cherries not known to us. With the round spreading top of the Morellos they have the excellent fruit of the tall growing Heart varieties, and a leaf that can defy our summer changes. Some of the amarels of this region seem a cross of this sweet cherry with the form of Morello, of which our Leib is a type.

The apricots of Galicia and Transylvania, and their form of English walnut (*Juglans regia*), are equally worthy of trial in the Missouri belt, together with their filbert, currants, gooseberries, and even grapes. Though we have failed with the French grapes, the northeastern varieties are well worthy of trial, as their foliage will stand our air quite as well as our native *V. labrusca.* We saw on the Volga many tons of dried grapes from northern Persia and Bokhara, which were infinitely superior to our home sorts. Where they will endure the winters they are eminently worthy of trial.

In this region no hardier peach is found than those we have. The coming peach for the Missouri belt is from northwestern China. While equal in fruit to our best sorts, it is able to endure greater extremes of temperature.

The belt across the Mississippi Valley corresponding to southern Iowa may experiment with the same races of fruits, and from a portion of the same great plain, but farther to the east.

The provinces of south Russia, east of Poland to Kiev, are well supplied with choice fruits, and the soil and climate are as nearly identical with ours as they well could be. Many varieties of the Galicia belt will not be found, but their places are taken by others but slightly, if at all, lower in the scale of value. The most positive change is with the

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pear. Many of the best dessert varieties here become tender, unproductive and short-lived, and their places are taken by slightly coarser varieties of the Bergamot and Gucha type. The best of the Griotte cherries are still found, and many varieties of the Glaskirke, and a form of the Geans much like our Dukes, but with different leaf and a lower spreading top. The *Juglans regia* is still productive, but is sometimes injured by the test winters.

For the belt across the valley corresponding to central and northern Iowa, the fruits of the black soil prairies of the great provinces of Orel, Koursk, Varonesh and Saratov, in central Russia, will best meet the requirements of soil and climate. Apples, pears, cherries and plums are yet found of such size, appearance and quality as would surprise any member of this organization suddenly set down in the midst of one of their great commercial orchards. The visitor will rarely find a variety of any of these fruits which he found six hundred miles eastward. The very few exceptions, such as Autonovka and Longfield apples, and Bessemianka and Red Bergamot pears, we are told at once are strays from central Russia, thriving equally well in a less extreme climate, as does our Duchess apple. Excellent forms of the Griotte cherries are still found, and many varieties of the low-growing sweet cherries and amarels are grown with greater or less satisfaction, depending upon soils and mode of growing. The apricot and mulberry are yet grown in considerable quantity, but the varieties are lower in quality for dessert use than farther west.

The belt corresponding with Minnesota up to the forty-fifth parallel, including southern Dakota and northern Wisconsin, will reach the highest attainable success with the fruits of Simbrisk, Penza, Riazan and Tula, on the north line of the black-soil section of central Russia. The visitors to these little known provinces, reaching up to the 55th parallel of north latitude, will be surprised to find so many varieties of excellent apples for all seasons, and so many variations of the indigenous Bergamot and Gucha pear, most of which are excellent for culinary use, and a few are from fair to good for eating.

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The only forms of the cherry grown in quantity are of the Griotte race, and the trees are grown in commercial orchards, in bush form, with several stems, and pruned on the renewal system of taking out the old wood. In size, flavor, and amount of grape sugar, they far excel any one of the Kentish type found in south Europe.

To those who conclude that the apples of this high latitude in Europe will materially change their season of maturity when grown in the Minnesota belt ten degrees farther south, it will be well to suggest that the prevailing summer winds of this part of Russia are from the southeast, coming up from Persia, Arabia and the heated steppes of southeastern Russia. Hence the average summer temperature is really higher than that of the Minnesota belt across our valley, while the winters are much colder and with less average snowfall.

In the extreme upper portion of our valley, in northern Dakota and Minnesota, even in the great valley with a northern trend at Lake Winnipeg, the possibility of successfully growing the apple, pear and cherry exists. The ancient provinces of Kazan, Nishni-Novgorod and Vladimir — even north and far to the east of Moscow, on the 57th parallel of north latitude — grow apples for all seasons, of excellent quality, in a commercial way. In this coldest orchard region of the world the little trees seem as hardy as the Siberian crabs, yet the fruit sells well in Moscow in competition with that from the south.

The far northern pears of this section are quite hardy in tree, but the fruit is too low in quality for consumption in the large cities. Yet it is grown in great quantity for culinary use among the peasants and for exporting to Perm, on the northeast verge of the plain. As an ornamental tree this far northern form of the Bergamot has much merit, and it gives us a hint of possibilities in the way of originating, by crossing, pears of excellent quality for the extreme northwest.

The cherries of this region have had a historic record for centuries. In Vladimir, one hundred and fifty miles east and north of Moscow, they are grown in quantity too sur-

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prising for popular belief in our valley. Though somewhat smaller than the best Griottes of the south parts of the plain, some of the Vladimir varieties are nearly sweet and of decidedly good quality for any use. That they can be grown as far north as Lake Winnipeg, in Manitoba, we do not for a moment doubt.

Plums, approaching our Damson in quality, and much resembling it in size, form and color, are grown in quantity in this far northern section of the steppes. That they will prove an acquisition in the extreme northwest is beyond doubt, if the curculio will respect them to the extent of giving us an occasional crop.

These hasty suggestions as to the adaptation of the fruits of special portions of the greatest steppe section of the world to special belts across the prairie states of the west, must of course be of a general character. In practice they would be modified by the varying soil and climate of the east and west portions of each belt, and the belts would overlap with special changes of soil, elevation, exposure, etc.

The only purpose is to outline some profitable lines of work for the experimental stations, now in process of organization and development in all the states of the valley. We have learned that the process of acclimation is a tediously slow one with our trees, and I believe our people are about ready to encourage the policy universally accepted by the European governments in the management of their colonies, viz.: The introduction of cereals, grasses, fruits, shrubs, etc., from like climates and soils, if they can be found on the earth's surface.

With the limited pecuniary means at command, we are doing what we can in the line indicated on the grounds of the Iowa Agricultural College at Ames. We have now growing, specimen plants of the apple, pear, cherry, plum, apricot, peach, juneberry, walnut, ornamental trees, shrubs, etc., from every part of the great east plain of Europe I have named. Their summer and winter behaviour for the past two years in our climate has been exactly in accordance with what we might expect from their relative position in their natal home. To briefly illustrate: The leaf of the

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Richmond cherry has been defective with us for two years, and last winter the trees were killed to the snow-line. On the other hand the Griottes and Russian Glaskirke varieties have maintained perfect foliage and have been unharmed by the test winter. In like manner the Flemish Beauty pear has not had, during the past two summers, a single leaf free from the brown fungus on the under surface, and last winter the trees were either wholly killed or so lowered in vitality as to be really worthless. The Besi de la Motte, from the edge of the great eastern steppe, has maintained healthy foliage, but its wood was slightly colored by the test winter, yet it has made rapid and healthy growth the past summer.

The Bessemianka, Tonkavetka and other pears from central Russia have maintained perfect foliage, except for slight injury by the pear leaf mite, and the terminal points of the shoots were as clear and bright last spring as the wood of Russian poplars.

Our apples of the grade of hardiness of Ben Davis, Jonathan and Dominie were defective in leaf the past two years, and last winter were irreparably ruined. On the other hand, our old varieties from the east plain, or their descendants and over two hundred varieties recently imported, started from the terminal points where grown upon rich garden soil.

Yet our collection is too varied for any one experimental station of the west, as it embraces varieties which will do best in the Missouri belt, and varieties which should do best in the belt of north Dakota and Minnesota. If the experimental work could be distributed and each of the belts across the valley I have tried to indicate could experiment with the products of its corresponding section of the east plain, the work could not fail to result in advancing our horticultural interests. So far, in talking of Russian fruits, we have not taken into account the enormous extent of the empire. We do not want the fruits of St. Petersburg or any part of the coast section within three hundred miles of the Baltic. That we do want the fruits of the provinces named in this connection I am equally certain, if properly distributed

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over our great valley. We must never forget that we must have in our valley, from the Missouri belt northward, varieties of all the fruits that will maintain perfect health of foliage, or we can not expect paying crops of perfect fruit. A tree may endure our winters passably well, yet on account of leaf trouble during our dry, hot summers, it fails to develop the cell structure of the wood in the perfect way needed for holding and perfecting the fruit crops. With the advent of varieties as perfect in leaf as the Duchess apple, the Bessemianka pear, and the Vladimir cherry, we may expect a show of blossoms to be followed by perfect fruit.

The crying want of the Mississippi valley is well endowed experiment stations. With their aid we may be able to walk without the leading strings, which so far in our history have been furnished us by the nurserymen of the eastern states.—Professor Budd, in *Trans. Miss. Vall. Hort. Soc.*

GRAFTING AND BUDDING NOTES.

Professor J. L. Budd relates, in *The Students' Farm Journal,* that part of the same lot of root-grafts of pear, plum and cherry failed to grow, while the rest made a perfect and healthy union. The only difference was that upon the first common grafting-wax was used (the boiled oil in which is believed to have been adulterated with some substance capable of fatally injuring vegetable tissue), and upon the latter the alcohol mixture for grafting, prepared as follows: "Melt six parts white rosin with one part beeswax; remove from stove and partially cool by stirring, then add gradually—with continued stirring—enough alcohol to make the mixture, when cool, of the consistency of porridge. In the temperature of the grafting-room it will remain sufficiently plastic to permit applying to the cut surfaces with the finger."

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CARE OF CIONS OF THE STONE FRUITS.

The subject is worthy of more attention and careful experimentation than it has yet received. An experiment like the following will be conclusive: — Pack away a bundle of cherry cions in November in moderately moist moss, in a moderately moist cellar. In January use these for putting up, say 500 root grafts. At the same time, and with the same roots, put up 500 grafts with cions of the same variety packed in November in dry leaves, in a box in the same cellar. Set by the same man in similar soil, it will always happen that the stand will be from twenty to fifty per cent. better with the dry cions. If the cions be used for top-grafting, or crown-grafting in the open air, the difference in the stand will be far greater in favor of the dry cions.

My attention was first called to this subject in March, 1870. The cherry cions I was using in top-working were cut in November and kept in the cellar in quite dry moss. They were nice and plump, with a show of callusing at the base. I was sure they were in fine order, yet less than five per cent. of them grew. The same day it happened that I put in a dozen or more cions, received by mail from the old homestead in New York. These were so dry that the bark was shriveled, and I only expected to save the variety by the possible growth of one or two specimens; but they all grew. Since that time I have experimented largely with the stone fruits, and am certain that the cions should be kept as dry as is safe. In all cases — unless the cions be scarce and valuable — they are thrown away if they show the least trace of the starting of a single bud or of callusing at the base.

The principle involved is the reverse of our attempts to graft the cherry after the water coming up from the roots has commenced to change the starch of the cell structure of the stock into sugar water. If we expect a uniform and satisfactory union of cion and stock, both must be in dormant condition. The cions of the apple and pear do not absorb

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water so readily; yet with these I have known many poor stands to result from the use of water-soaked cions.— Prof. Budd, *in Rural New Yorker.*

Prof. Budd's remarks about the care of stone fruit cions, in the *Rural* of December 27, furnish a text. His statement proves that cherry cions packed in dry leaves are better than those kept in damp moss. So far, good. But I have to relate, from my own experience, a novel plan, which works with entire success; whether it is due to the climate of California I have no means of determining. I used to procure my cions in the fall, and put them away carefully in the approved fashion; then I worked them in the spring, subject to a percentage of loss. Some years ago, running short of prepared cions, I ventured to cut from a Prune d'Agen in the orchard, and within a few minutes the cions were securely grafted on an almond tree, where, to my great gratification, every one of them grew famously and bore fruit. The publication of this result caused the transformation of many barren almond orchards into the French prune. Since then this harum scarum plan has worked so well that I make a point of getting fresh cions—apples, pears, plums, grapes and so on— of neighbors and nurserymen when they have something new, and I put them in as soon as I reach home. I no longer bother about their preservation, and never procure them until I am ready to graft. Possibly this is not news to your horticulturists; but if fresh buds are worked successfully with you, why not cions? — J. B. Armstrong, in *Rural New Yorker.*

I felt some interest in the experience of the *Rural's* Sonoma, California, correspondent, who reports such good results from using freshly cut cions. As I have had similar results here in eastern Ontario, his success cannot, I think, be explained by climatic influence. I commenced cautiously in the spring of 1883, using freshly cut cions (apple). These made such a surprisingly strong growth that I followed, last spring, with several hundred more in the same way, which have done equally well — certainly less than two per cent. failed.— J. G. H., in *Rural New Yorker.*

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APPLE GRAFTS.

Mr. A. Willis, Franklin Co., Kansas, writes: "For two years I have been troubled with what some call fungus growth in the joints of my root grafts. The root appears good and starts nicely, as does the cion, but there is injury in the joint. Those grafted early suffer most." Prof. Budd, to whom the matter was referred, says: "The disease is caused by a fungus growth, and is a common trouble. To prevent it, clean out all old packing material, every autumn, whitewash thoroughly, and use only fresh material for packing.— *Prairie Farmer.*

TOP-GRAFTING OLD APPLE TREES.

Top-grafting large trees is at best but a harsh and unnatural process, and it should be practiced with caution. If a tree bears moderately good fruit, a grower should consider well before top-grafting it. An apple below the average in quality often makes good pies, sauce or dried fruit. If the apples can be turned to any profitable use, and the tree is twenty years old, it is doubtful if it will pay to top-graft it. Much will depend on the thriftiness of the tree. A man who feeds his orchard, and prunes it regularly and judiciously, need have less hesitation about top-grafting. Trees receiving such treatment will stand a much better chance of fully recovering from the shock of grafting. Much also depends upon the manner in which a tree is grafted.

The old-fashioned way was to graft a few large limbs low down in the tree, and just above a crotch where the remaining branch would "draw up the sap." A man who persisted in grafting in this manner could never operate in an orchard of mine. The newer and safer way to graft is to cut far out on the branches, where they are no more than an inch in diameter, and to set many stubs, and in such positions as to imitate the form of a symmetrical tree. If a main limb branches where it is two or three inches in diameter, graft both branches rather than cut off the limb below the crotch. If a tree has been properly pruned, nearly all the limbs may be grafted. If it has not, many besides the grafted limbs

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will have to be removed; and if the tree is old, and especially if a little feeble, it will be likely to suffer. A good grafter will try to leave enough small brush in the center of the tree to screen the trunk and large branches from hot suns. I have often known trees to be seriously injured by sun-scald after having been severely pruned. A tree which would contain seven or eight stubs under the old system of grafting will contain thirty or forty under this system. Two objections will at once be raised to this method: As grafters charge by the piece, it is expensive; it makes the top too high, and makes bean-poles of the main branches. To the first objection, I reply that no apple-grower should hire a grafter; he should be able to do the grafting himself, or else his boys should do it. The second objection is a more serious one. I have seen top-grafted trees whose larger branches were entirely leafless for seven or eight feet, and crowned with a bush. Such trees are of course a nuisance, but they are due to a bungling grafter, not to the plan of grafting many limbs and small ones. There are enough side limbs on the average tree which can be grafted, and this difficulty is obviated. If there should not be side limbs, some of the sprouts which start after the tree is grafted, may be encouraged and grafted in a year or two. One must not expect an old tree to have as good a shape after grafting as before. It can sometimes be secured, but not often.

Old and long-neglected trees which are to be grafted, may often be given a preparatory pruning for two or three years with profit. Unnecessary limbs can be better cut out before grafting than afterward; for after the grafting is done, and so much of the top removed, these limbs grow rapidly and soon show a marked increase in diameter. So much of the tree top will be removed in grafting, that the unnecessary limbs should not be cut away for two or three years, or more, if they are large. It is not always an easy matter to prune a grafted tree properly. The ungrafted limbs must be gradually removed, and the grafts themselves must be trained. The ungrafted limbs should be annually cut away in about the extent to which the grafts grow, or a little more. All

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suckers should be removed as they form during the season, unless there is noticed a tendency to sunscald. The suckers may then be needed to shade the trunk and branches. I have known of a few cases in which nearly all the ungrafted branches were taken off the second year, without apparent injury to the tree, but I have known of many more cases in which such treatment has been ruinous. Improper pruning of top-grafted trees often results in an abundance of flat-headed borers. When the tree is weakened, borers attack it. I have several times observed the gradual weakening and final death of large trees which were severely top-grafted. Large trees must have had good treatment before the operation is performed as well as after it. The longer that good culture has been given a tree, the better able will it be to revive vigorously after a thorough grafting. I have so often seen ill results follow from grafting large trees, that I wish to discourage the practice, unless all conditions be favorable. I have often grafted old trees when I was confident that they could never resist the operation, although their owners would not believe it until too late. If the tree is not perceptibly lessened in vigor, it is at least probable that it will be made a sprawling and unsatisfactory object. — Prof. L. H. Bailey, Jr., in *Country Gentleman*.

HOW TO DESTROY OLD ORCHARDS.

Useless old orchards bearing seedling fruit occupy valuable soil all over the country. Do not attempt to graft them for it will not pay. Destroy them at once and plant young trees. Some people get tackle and pull such trees over by hitching to the top. Others dig about and cut the roots, then fasten a rope from the top to the axle of a wagon loaded with stones. Our method is to dig about and sever the roots branching out, then let the wind blow them over. The fall and winter winds will never fail — they will push harder than any half dozen teams. Think of the forest trees the winds tear up. We have tried this method and recommend it. Only keep from under them when the wind blows.—*Green's Fruit Grower.*

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"TIGHT LACING" OF TOP-WORKED STOCK.

On account of trouble at the west with the stems of cherry trees, the Miner plum has been recommended as a stock on which to top-work the Richmond cherry and other varieties doing well with us. The cherry takes well on the Miner stock. A nice top is formed early in the season, but the stock fails to increase in size and soon dies — root and all — from sheer starvation. At first I suspected want of affinity, and perfect union of stock and cion, but closer inspection revealed the fact that the heading back of stock and the dormant condition of the cambium layer and bark during the first stages of the growth of the cion, so hardened the naturally elastic epidermis as to totally prevent expansion and growth when the time came for a new wood deposit.

To prove the correctness of this belief, we planted six one-year-old Miner plums in our experimental orchard, and top-worked them, the next March, with cions of a fine cherry, from the east plain of Europe, known as "Bessarabian." All the cions grew rapidly. In June the tough outer bark of one of the stocks was slit on the north side, to permit expansion. This is now a fine tree with a clean, healthy stem and a fine, round top loaded with blossoms. The five trees untreated had nice tops in the fall, which had outgrown the dry, dead-looking stocks, and by the middle of the next summer they were all dead without apparent increase of diameter of stock.

In like manner I find that plum grafted on plum, and cherry on cherry,— where the top is entirely cut back in putting in cions — show a tendency to a hardening of the tough epidermis and to constriction and disease of stem. In some cases we have entirely removed the outer bark; in others merely slitting it to permit expansion has answered.

I should add that in top-grafting young apple and pear trees, we notice in our climate the same tendency to the hardening of the bark and a constriction of woody tissue, which is materially obviated by cutting the "corset strings."

But my purpose at present is to direct attention to the

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Miner Plum as a stock for the cherry in the west.—Prof. Budd, in *Rural New Yorker.*

Young experimenters who have been laudably trying to establish at their own homes some fine sort of fruit by the simple process of inserting buds, can readily tell whether the budding has been successful even before they loosen or remove the ligature. If the short bit of leaf-stem left on the bud drops off at a touch leaving a flat, even disc of separation as when a leaf falls naturally, the bud has taken and has become a part of the tree it was inserted in. If shriveled and not readily detachable it is a failure. Buds that are sliced from quite ripe, plump, firm shoots, late in August or September, and neatly placed and tied in a thrifty shoot in which the bark separates freely so late as that, very rarely fail.—Blairco, in *New York Tribune.*

PRUNING NOTES.

TIME FOR PRUNING YOUNG TREES.

The frequent injury caused to young fruit trees, and especially to those recently transplanted, induces us to repeat the advice to do whatever shortening-back may be required before growth commences. We have seen young honey-locust hedges also nearly ruined by cutting-back after growth had commenced. A row of young apple trees three or four years old was planted in a new position, and the shoots were cut back after the leaves were an inch long. Not one of the trees grew two inches that year, while a growth of six inches or a foot would have been made had the pruning been done earlier, as other trees transplanted at the time indicated. Some trees are less injured by such treatment than others, and sooner recover, as for instance the peach and the osage orange.—*Country Gentleman.*

PRUNING ORCHARDS IN WINTER.

An apple orchard which has been well managed from the beginning, needs very little pruning afterward. Needless

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shoots are rubbed off as soon as they make their appearance, with a tenth of the labor required subsequently for their removal with the saw. But this timely work is not always performed, and many trees have become dense in their tops, which sometimes present the mass of brush represented by fig. 1. It is advisable in such instances to thin

Fig. 1. Unpruned Tree.

them moderately and gradually, in successive seasons. It is common to cut too much at a time. But a greater fault is to thin the interior and to leave the outside as thick as ever, as shown in fig. 2. This mass of brush excludes the

Fig. 2. Wrongly Pruned Tree.

sunlight, the twigs and leaves are small and crowded, and as a consequence the fruit is small and defective. The tree being made taller by this treatment, and the branches successively run up to a height, the fruit is more difficult to

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gather, and the windfalls are bruised in falling. The proper course is to thin in from the outside, to let the sun in to every part, as represented by fig. 3. Every portion of the

Fig. 3. Correctly Pruned Tree.

head, and not the outside merely, thus receives the benefit of the sun's rays, and the leaves and fruit have room to become fully developed.

There are some details of the work which can be learned only by experience and by observing the requirements of trees of different forms and habits of growth. It may be observed, however, as general rules, that the remaining branches should be as evenly distributed through the head as practicable, and that the limbs be not run out in long, bare poles, but sufficient side branches retained to give a good general shape. It is well to remember that it is better to prune too little than too much, and that pruning cannot be successful if cultivation or top-dressing with manure is neglected.

This operation of pruning, when required, may be done any time in winter in regions where there is no danger of injury by intense cold, wounds always rendering trees more tender. But there will commonly be little danger if the pruning is quite moderate, as it always should be. In very cold regions it may be well to defer the work till the approach of spring, but it should be always done before the buds swell, when pruning would check growth. The wounds may be protected from rains and decay with a coat of paint.— *Country Gentleman.*

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PAINT AND TREES.

A pot of paint really costs but a few cents, and may be made to save many dollars' worth of trees. When wounds and the stumps of limbs which have been cut off are covered with paint, the wood will be preserved until it heals over; whereas, when not painted, it is liable to rot and weaken the tree, causing premature decay and death. I think too much of trees to neglect them, and lose the care and waiting of years on account of the work of a few moments.—F. D. C., in *Rural New Yorker.*

SPLITTING AT FORKS.

Various devices or remedies are given in the papers from time to time, to prevent forked apple-trees from splitting. Iron bolts are inserted; iron bands are employed; ropes are used to draw the parts together; branches are drawn together and interlaced, etc. Prevention is best, and well-formed heads will not split down. Two main branches, diverging from each other at an acute angle, should not be permitted. An even and spreading head will not split, nor will any tree be liable to injury if not allowed to overbear. The practice of propping up the limbs of fruit trees indicates that the trees are not well trained, or that they are allowed to overbear, or both.—*Country Gentleman.*

Crotched fruit-trees of any kind can be kept from splitting down by twisting together one twig from each of the main branches. These thus twisted will in five years grow into a solid branch that cannot be broken. Twigs which grow from the lower part of the branches are preferable. If there are no such twigs on the branches, a 'water sprout' or 'sucker' should be allowed to grow; or one may be started by nicely inserting a cion into a slit between the bark and wood, and securely waxing it. Twigs from the size of a lead pencil to half an inch in diameter can be used for this purpose.—*Florida Dispatch.*

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PROTECTION FROM MICE AND RABBITS.

Take very small pieces of tallow for the former, and carrot for the latter; put into each one-tenth of a grain of strychnine, and drop the pieces where the vermin frequent. Two doses for the winter will prove effectual.

The frequent snows render it necessary to follow up the remedy faithfully, and, especially in grass land, the snow should be trampled around the base of the trees to prevent mice from working around under the snow. For want of these precautions the labor and waiting of years may be spoiled by these garden pests.— J. C. P., in *Western Farmer.*

Professor J. L. Budd, as a cheap and easy preventative of girdling by mice in winter, advises piling before the ground freezes "a small neat mound of soil around each tree of the young orchard." To properly protect as many as two hundred in this way would, he tells the *Iowa Register,* be a light day's work.— *New York Tribune.*

The best way is to tie about the trunk strip laths or barrel staves, cut 1½ or 2 feet long. These are a perfect protection from woodchucks, rabbits, mice and borers, cheap and easily applied. The writer has used them for 15 years in a large orchard, and never lost a tree from any of the above causes, while other orchards near him have been almost ruined by them.—*Rural New Yorker.*

Dr. Sanborn stated, at a meeting of the Illinois horticultural society, that he protected completely from rabbits and mice his 600 pear trees, with a wash of lime and water, with enough copperas added to change the color to a deep green. Some cheap glue was added to make it adhere to the trees. Neither rabbits nor mice would touch the trees thus treated.

Mr. Alfred Smith, the venerable and honorable pomologist of Monmouth, Me., shows an apple tree, large enough to bear a bushel or two of fruit, which three winters ago was completely girdled by mice. There is now little mark left of the damage, some cions having been slipped into

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the bark below and above the wound at grafting time in the spring, after the injury was discovered.—*New York Tribune.*

Trees girdled by mice may be saved by banking over the injury with earth; if done before the wound gets dry a continuous bark will form and leave no scar. I have saved trees six inches in diameter that were completely girdled a foot or more in height. If done in season it will generally save the tree.—A. G. Tuttle in *Western Farmer.*

TINEIDAE INFESTING APPLE TREES AT ITHACA, NEW YORK.*

The following is a list of the Tineidae which I have found infesting the apple trees at Ithaca.

1. *Lithocolletis crataegella* Clemens.
2. *Ornix prunivorella* Chambers.
3. *Aspidisca splendoriferella* Clemens.
4. *Tischeria malifoliella* Clemens.
5. *Bucculatrix pomifoliella* Clemens.

Besides these it is probable that another important species, the Apple Coleophora (*Coleophora malivorella* Riley), will be found here, as it occurs in orchards near Rochester and Geneva. From all but the third (*Aspidisca splendoriferella* Clem.), I have bred one or more undescribed species of hymenopterous parasites. These were referred to Mr. L. O. Howard, who has studied them and kindly furnished me with his manuscript names of the species.

THE SPOTTED TENTIFORM MINE OF THE APPLE.

(*Lithocolletis crataegella* Clem.)

Plate I, Figs. 1–1d.

Larva on the under side of apple leaf, making a tentiform mine which has the upper surface spotted or honeycombed, and pupating in one end of the mine.

About the middle of September the leaves of the apple trees were found to be mined by a yellowish larva which

*We are indebted for the figures used to Professor Comstock.

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fed on the under surface of the leaf in a tentiform mine, and which proved to be *Lithocolletis crataegella* Clem. These mines (Pl. I, Fig. 1a.), are spotted or honeycombed on the upper surface; the lower surface is formed of silk spun on the lower surface of the leaf. This silk turns brown when old, and is the only silk in the mine while the larva is feeding. The spotted or honeycombed appearance of the upper surface of the mine referred to above, is due to the way in which the larva feeds. It will eat a little in one place and then move off to some other part of the mine and eat a little there. Even the smallest veinlets are not destroyed, and usually the parenchyma along the veinlets is left undisturbed, the larva eating only a small portion of the parenchyma included in the cells formed by the smallest veinlets. If the miner has not been very voracious considerable patches of parenchyma will still be left, while on the other hand, in some cases the venation of the leaf will show plainly in some parts of the mine. Where the miner has eaten, the upper epidermis has a dirty whitish appearance. The frass, in the shape of rounded pellets, is collected in a string-like mass in some part of the mine.

When about to pupate the larva goes to one end of the mine and weaves a loose silken covering, usually quite dense, around itself. Inside of this it casts its larval skin, and remains a pupa over winter. I have collected the pupae as early as September 27th, and the larvae as late as October 18th. In the spring the pupa forces itself nearly out through the lower surface of the mine and there gives forth the moth.

This insect is not very abundant, but somewhat more common than the following species (*Ornix prunivorella* Chambers). When abundant enough to injure the trees the proper remedy would be the one suggested by Prof. J. H. Comstock in the case of *Lithocolletis hamadryadella* Clem.,* which is to gather and burn the fallen leaves. In this way all the hibernating pupae would be destroyed.

* U. S. Agricultural Report, 1879, p. 230.

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Below I give descriptions of the larva and pupa; also Chambers' description of the adult.

LARVA (Pl. I., Fig. 1 b). Length 5 mm (.2 in.). Form cylindrical. Head longer than broad, wedge-shaped, quite pointed and bilobed. First thoracic segment twice as wide as the head. Second thoracic segment wider than the first and as long. The segments following decrease in width and length until we come to the third, fourth and fifth abdominal segments which are as wide and as long as any of the segments. After these the segments taper again quite markedly. When the larva is young the third, fourth and fifth abdominal segments are relatively not as large as when the larva is full grown, and hence it has the appearance of tapering from the second thoracic segment to the rear. Color: light yellow throughout. Thoracic, abdominal and anal legs present. Hairs on the segments numerous and long. One dorsal and two lateral rows of hairs on each half of the body. On each abdominal segment excepting the last, the dorsal row of hairs is composed of two hairs, a long and a short one, the shorter being placed in front of the longer. Around the anal opening and projecting backwards are six incurved hairs.

PUPA (Pl. I., Figs. 1 c and 1 d). Length 3.4 mm (.15 in.). Length from head to end of antennal sheaths 2.8 mm (.11 in.). Greatest width .8 mm (.03 in.). Antennal sheaths and wing cases extending down as far as shown in the drawings. When the pupa is contracted, however, the third segment from the last is drawn up nearly out of sight, thereby causing the sheaths of the appendages to appear to extend down farther. Head furnished with rather a pointed beak. The anal segment has at its extremity two small, strong, excurved tentacles or hooks. The ventral surface of the head bears two long, straight, rather stout hairs. There is on each side of the pupa a complete and an incomplete row of hairs, and on each side of the dorsal surface another row of hairs. Color: yellow, with the head and dorsal surface light brown. Sometimes there is more brown than yellow.

ADULT (Pl. I., Fig. 1). Fore wings golden brown, with median and dorso-basal white streaks, which are frequently continued on to the thorax. Face and under side of antennae silvery white. Tuft brownish. A white streak extending along the base of the dorsal margin as far as the basal fourth of the wing length. Black apical spot. Hinder marginal line at the base of the cilia. Three dorsal and four costal streaks, the third dorsal minute, the second large and the first very large. First costal very oblique and fourth pointing obliquely forward. First costal and first and second dorsal streaks dark margined on both sides, the others only dark margined before. The dark margins of the dorsal and costal streaks frequently extend back to the apical spot. Alar ex. $\frac{3}{16}$. to $\frac{5}{16}$ in.

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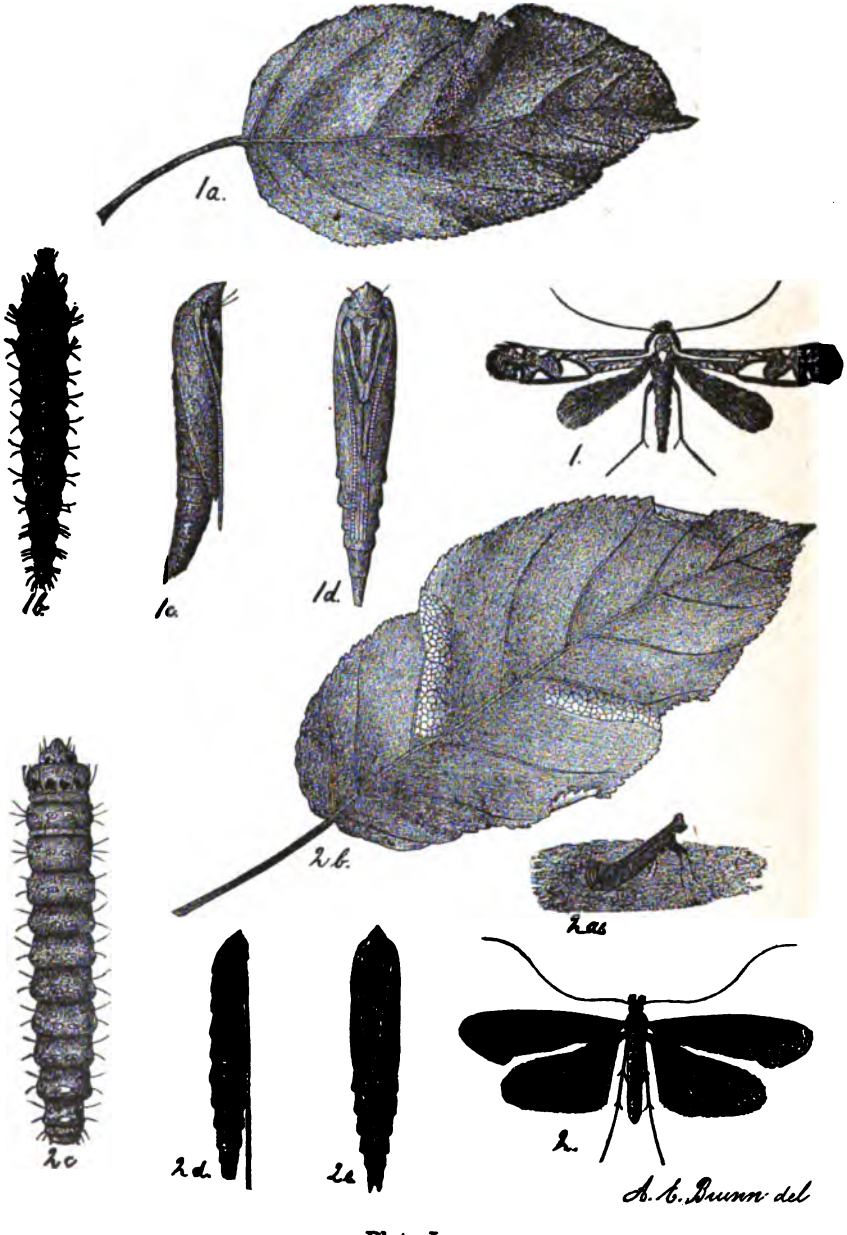

Plate I.

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Natural enemies.—From this species I bred two undescribed chalcid parasites, *Sympiezus lithocolletidis* Howard MSS. and *Eulophus minutus* Howard MSS.

THE UNSPOTTED TENTIFORM MINE OF THE APPLE.

(*Ornix prunivorella* Chambers.)

Pl. I, Figs. 2—2c.

Larva on the under surface of apple leaves making a tentiform mine, eating the parenchyma clean, and pupating at the edge of the turned-up leaf in a silken cocoon.

At the same time that I found the mines of *Lithocolletis crataegella* I also found in connection with them, often on the same leaf, mines which I at first was not able to distinguish from them; but containing quite a different larva, and which proved to be *Ornix prunivorella* Chambers. After a little examination, however, the difference between the two was very evident. While the mine of *L. crataegella* has on the upper surface a honey-combed or spotted appearance, and the venation of the leaf does not show plainly; the mine of this insect (Pl. I, Fig. 2b) does not appear spotted and shows the venation of the leaf quite distinctly. Moreover, while the larva of *L. crataegella* eats the parenchyma in spots and leaves the upper epidermis of a whitish color; the larva of *O. prunivorella* eats the parenchyma clean as it goes and leaves the upper surface of the mine brown.

As my observations commenced rather late in the fall, I was unable to observe the larvae when young. When nearly mature they leave the old mines and make new ones. To describe in a few words the way they proceed in making these new mines: quite a dense but still very transparent silken covering is spun on the under side of the leaf, and as a rule enclosing more space than *L. crataegella,* this being a larger larva. While weaving these threads from side to side over the space to include the so-called mine, the larva rests on the threads already spun. In this way the larva may by its weight (?) aid in causing the mine to assume its tentiform shape. When this covering is completed the larva crawls in between it and the leaf and completes the mine from the

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inside by spining more threads from side to side and drawing the edges of the mine very close together. The under surface of the mine thus becomes more opaque from more silk being spun there, and also as the silk itself which is at first white becomes brown.

Soon the larva commences to feed, beginning at one end of the mine and eating everything clean as it goes, excepting the small veins and upper epidermis.

When through eating, or when all the parenchyma in the mine is eaten, the larva leaves the mine by an opening which it makes in the under surface, and either pupates in another portion of the same or a different leaf; or if not through feeding it makes a new tentiform mine on the disk of the leaf, or turns over the edge of the leaf and feeds on the infolded portion. I have known the larva after leaving the old mine to turn down the edge of the leaf on the upper surface twice in order to feed. In some cases where the mines were opened, but still not much of an opening made, the larvae closed this opening and went on feeding, while in other cases if so disturbed they made new mines or else pupated. The larvae deposit the small, rounded pellets of frass in an irregular heap in one end of the mine.

When about to pupate the larva leaves the mine through a small circular hole which it makes at one end and on the under surface of the mine, goes to some portion of the edge of the leaf, either on the upper or lower surface (very seldom on the lower), folds the edge over itself, bringing it close down to the surface of the leaf by silk, and then spins around itself in this roll a delicate silken cocoon. Within this cocoon it casts its larval skin and transforms to a pupa, remaining in that condition throughout the winter. It takes less than twenty hours for the larva to make the roll within which it pupates. In exceptional cases the larva will spin its cocoon in the fold of the leaf caused by its mine and at some distance from the edge of the leaf. Often the larva goes to the very tip of the leaf, and brings the two edges together, making its cocoon within this fold. The pupae, I have collected as early as October 3d, and the larvae, as late as October 26th. A young, white larva which I collected

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November 6th, turned gray upon placing it in alcohol. In the spring the pupae transform to dark steel gray moths, which when at rest assume the position shown in Pl. I, Fig. 2a.

The mines are common here at Ithaca, but not abundant. They are not sufficiently numerous to injure the trees, although I have several times counted as many as five in a single leaf. If they should become too numerous the same remedy would apply here as in the case of *L. crataegella.*

Below are given descriptions of the larva and pupa, and Chambers' description of the adult.

LARVA. (Pl. I. Fig. 2c). When full grown 6.8 mm (.27 in.) in length. Color, grayish; when young flesh colored. Head light brown and about one half as broad as the first thoracic segment, which is light yellow. Form cylindrical with the last three or four segments of the abdomen tapering slightly. With the exception of the head and first thoracic segment there are on the dorsal surface four longitudinal rows of white elevations, each segment having at or near its middle one of these elevations in each row. There are also two rows of similar elevations on each side of the larva. Towards the caudal end of the larva the two middle dorsal rows run together. Other rows of tubercles disappear in the last abdominal segments, leaving fewer white elevations on these segments than on the others. From each of these elevations arises a hair of considerable length. On or near some of these tubercles of the middle dorsal rows arises a second, but quite short hair. Also numerous small hairs on the head, first thoracic segment and anal segment. Upon the dorsal surface of the head are four very black conspicuous spots, and on each lateral surface an indistinct one. Also on the dorsal surface of the first thoracic segment are four similar but larger black spots. Thoracic, abdominal and anal legs well developed. The thoracic legs have the outer surface almost entirely black and smooth, while the inner surface is gray and furnished with hairs. Abdominal and anal legs of same color as the larva.

PUPA. (Pl. I. Fig. 2d and 2e). Length from head to the end of the antennal sheaths 5 mm. Breadth at widest part 1 mm. Antennal sheaths extending beyond the anal segment. Head furnished with quite a prominent beak. Two rows of hair on the dorsal surface and two on each side; the lower row on the sides being made up of two hairs, placed close together on each segment. No hairs on the head. Color: brownish yellow, with exception of the beak which is black and the dorsal surface which is brown or dark brown. The color of the dorsal surface is due to a roughened rectangular brown patch on all of the abdominal segments but the last, each patch taking up the greater part of the dorsal surface of the

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segment upon which it is placed, extending nearly to the sides and almost to the following segment. These black patches can readily be seen even in the cast off pupa skin.

ADULT. (Pl. I. Fig. 2 and 2a). Dark steel gray, almost brown. Labial palpi white, each joint tipped externally with dark steel gray. Antennae of the general hue, faintly annulate with whitish. Thorax and primaries dark steel gray, the primaries with about nine faint whitish costal streaks, the first near the base and the last at the apex, becoming gradually longer from the base to the apex, all faintly dark-margined internally, the last three or four nearly perpendicular to the costal margin, crossing the wing and uniting near the dorsal margin, where they are narrow and indistinct. A small black apical spot, behind which are three dark hinder marginal lines in the cilia; the second at the middle, the third at the apex and the first at the base of the cilia. The one at the base of the cilia becomes furcate in the dorsal cilia. Al. ex. ½ inch.

Natural enemies.— From this species I have bred two undescribed chalcid parasites, *Sympiezus lithocolletidis* Howard MSS. and *Eulophus minutus* Howard MSS.

THE RESPLENDENT SHIELD BEARER.

(*Aspidisca splendoriferella* Clemens.)

Mining the leaves of apple twice a year, and cutting out an oval case which it carries to the trunk or limbs, and attaches; a minute, whitish, footless larva, with a brownish head, and a yellow-brown spot on each segment.

The life history of this insect has been so well described and figured in the Annual Report of the department of Agriculture for 1879, by Prof. J. H. Comstock, that it would be of little or no value for me to go over the same ground. This insect is much less common than any of the other four species of Tineidae infesting the apple trees at Ithaca. Evidently then no remedy is as yet needed, but it is well to bear in mind how abundant they may become, although perhaps in this latitude (Prof. Comstock's observations having been made in Washington), our winters may be too severe for them. If however, the species found by Lord Walsingham mining Poplar leaves in Oregon* proves to be identical with this species some other reason than cold climate must be as-

*Chambers' "Tineina and their food plants," p. 107.

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signed for the small number of this Tineid here. From recent information received from Washington, I have reason to believe that, owing to the remedies used in the Department grounds for this pest, they are hardly more abundant there than here; which speaks very well for the remedy. The substance used was presumably that mentioned in the Agricultural Report for 1879, p. 212, namely, a mixture of one half bushel shell lime and six pounds of powdered sulphur, dissolved and brought to the consistency of a white-wash with hot water, and applied to the trees.

It is said of the hibernating larva (the only form which I have been able to examine), in the report for 1879, "no hairs observable." Those specimens which I examined had two lateral hairs on each side of the thoracic segments, and one hair on each side of the abdominal segments, also ten hairs on the anal segment. The position and number of these hairs agree with those of the full grown mining larva; but as they are very minute indeed, it is not surprising that they were not observed. Also numerous hairs on the head, and four dorsal hairs on the first thoracic segment.

THE TRUMPET MINE OF THE APPLE.

(*Tischeria malifoliella* Clemens.)

Pl. II, Figs. 1 to 1d.

Mining the upper surface of apple leaves, making a brown, trumpet-shaped mine scarcely observable from the under surface of the leaf; a greenish, footless, but active larva.

Many of the apple leaves in the fall were found to have very conspicuous brown spots, which being on the upper surface could be seen at quite a distance from the tree. Upon closer examination they assumed definite shapes and proved to be caused by the mining of the larval form of *Tischeria malifoliella* Clemens. The mine (see Pl. II, Fig. 1a), commencing in a glistening spot where the egg was laid, continues for a short distance as a narrow line, gradually growing wider, and then suddenly broadening out into an irregular expanded portion or "body of the mine," the

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whole having a trumpet shaped appearance. The color of the mine on the upper surface is usually some shade of brown, although I have sometimes observed it to be dirty white. From the under surface of the leaf the mine would hardly be observed unless held up towards the light or examined closely, when the mined portion of the leaf would be seen to be of a lighter shade of green than the rest. The linear portion of the mine on the upper surface is crossed by crescent shaped patches of white, which in many cases are continued for a short distance into the body of the mine. Often the miner, after commencing the body of the mine, will turn and eat around the linear portion, obliterating that part and causing the mine to appear like a blotch mine. In such cases the white crescent shaped patches will be found somewhere in the body of the mine indicating the position of the linear portion. These white markings are, however, wanting in some instances; but as the color of the linear portion of the mine is a little darker brown than the rest, we can still tell where the mine commenced. The position of the mine on the leaf is variable; it may be along the edges of the leaf, causing it to curl over at that point, or along the midrib, or else between these points. As the leaf dries the mine assumes a tentiform shape.

Within the mine we find a light green, active, footless larva. If any foreign body is brought into contact with the long hairs covering the larva, it will be observed to support itself by some of its middle segments and rapidly vibrate the rest of the body, this probably being the only way to frighten off parasites. In connection with this it is worthy of note that *Ornix prunivorella*, when approached in the same way, fastens itself by its thoracic and anal legs and vibrates the middle of its body.

The upper and lower surface of the mine of *T. malifoliella* are densely lined with silvery white silk. The excrement is deposited without the mine through one or more openings, which are situated at one end and on the lower surface of the mine. Within these clean and comfortable quarters the larva passes the winter. In the spring the larva transforms to a pupa at one end of the mine, making no cocoon,

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and in a short time forces its way partly out through the upper surface of the mine, and there gives forth the moth. The tearing of either surface of the mine causes the larva to die, as it seems bound to get out if it can, and once out it can neither return nor build a new mine.

This insect is the most abundant of the Tineidae infesting the apple trees at Ithaca, nevertheless it is not abundant enough to do them any material injury. The remedy, "collecting and burning the orchard leaves in the fall," would apply here as in the case of *L. crataegella* and *O. prunivorella* if they should multiply too rapidly.

Below is a description of the larva, and Clemens' brief description of the adult.*

LARVA. (Pl. II. Fig. 1b). Length, 5 mm. (.2 in). Head small, pointed, retractile and bilobed. Form flattened and tapering to the rear from the second or third thoracic segment. First thoracic segment twice as wide as head but not as wide as second thoracic segment. The last three abdominal segments are rounder and considerably narrower than any of the others. Between the first and second, and second and third thoracic segment are distinct folds. General color light green, with a brown or even black head. The large dark markings represented in the figure on the first thoracic segment are internal. No true legs, but four pairs of not very prominent prolegs, also anal legs. Three hairs on each side of the thoracic segment and two on each side of the remaining segments. Tentaculiform appendages and numerous hairs on anal segment. Plate II, Fig. 1c. On each side of the dorsal surface of the third, fourth, fifth and sixth abdominal segments there arise from the same point two short stiff hairs. A prominent ridge on each side of the lower, and two deep depressions on each of the thoracic segments.

PUPA. Unknown. This tineid proved very difficult to rear. Out of about one hundred mines gathered last fall, but four moths emerged. Owing to the fact that the larva dies if the mine is opened, I hesitated about opening many mines and am therefore unable to describe the pupa.

ADULT. (Pl. II, Fig. 1). Head and antennae shining dark brown, face ochreous. Fore wings uniform, shining dark brown with a purplish tinge, slightly dusted with pale ochreous; cilia of the general hue. Hind wings dark gray; cilia with a rufous tinge. (Clemens).

The Alar ex. is 7.5 mm. (.3 in.).

Natural enemies.—From this species I bred two undescribed chalcid parasites, *Sympiezus lithocolletidis* Howard MSS. and *Astichus tischeriae* Howard MSS.

* Tineina of North America, Clemens, p. 141.

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THE APPLE BUCCULATRIX.

(*Bucculatrix pomifoliella* Clemens.)

Pl. II. Figs. 2—2e.

Mining apple leaves for a short time, then feeding externally and making an elongated white ribbed cocoon, which may be found attached to the trunks and limbs of the trees.

As this Tineid is not abundant enough here to make accurate observations upon it, a quantity of cocoons containing living pupae were sent to me by Mr. J. Fred. Rose, of South Byron, N. Y., the past winter. The cocoons were kept in a cool room to prevent the moths from emerging before the leaves of the apple trees were out. On May 15th about one dozen moths emerged. These together with the remaining cocoons were placed on an apple limb inside a Swiss muslin netting. Three days later, between 5 and 6 P. M., some moths were observed to be pairing. From this and subsequent observations I believe this moth to be most active in the evening.

The greenish colored eggs are laid scattering on the under surface of the leaf. The eggs commenced to hatch June 16 or 17,* and the larvae bored directly from the egg to the upper surface of the leaf, where they made a small brown serpent mine. After the larva leaves the egg the shell collapses and turns black. If the egg shell be removed the circular opening made by the larva entering the leaf can be seen. The mine is usually but 1 mm. ($\frac{1}{25}$ in.), broad at its largest end. Where the mines are abundant on a leaf, it turns yellow and dies. On a small leaf I have counted twenty or more mines. The frass is deposited along the middle of the mine. When the larva has made a mine from $\frac{1}{4}$ to $\frac{1}{2}$ in. long, which it does in from four to five days, it eats its way out through the upper surface, then somewhere on the upper surface of the

*The great length of time (1 month) between the pairing of the moths and the hatching of the eggs, I attribute principally to the cold weather during that period, the average of the mean daily temperature from May 21st to June 21st being 61°. The mean daily temperature was derived by taking the sum of the morning and noon temperature once and the night twice and dividing by four.

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leaf it weaves a circular silken covering about $\frac{1}{4}$ in. in diameter. Stretched out on this network, the larva, which is now 2.6 mm. long, makes a small hole in it near its edge, then, as one would turn a somersault, the larva puts its head into this hole and draws its body after. Arriving inside the "molting cocoon" as it may be termed, on its back and doubled in the shape of a horse-shoe, the larva is then ready to strengthen the cocoon and close the opening which it made in entering. The larvae make these cocoons in from fifteen to thirty minutes; and usually within a couple of hours after leaving the mine. After the desertion of the mine and before the making of these cocoons, the larvae eat nothing, but may be found crawling over the leaves, stems and branches and often suspended by silk threads. On the 24th of June many of the cocoons were empty, the larvae having molted, leaving their cast-off skins in the molting cocoons, and cut their way out. The larvae remain in these cocoons in most cases less than twenty-four hours. The larva before molting is readily distinguished from its later stages by its yellow color and a large black spot on its first thoracic segment. After molting the first time the larva becomes dark green and has a number of small black spots on the first thoracic segment.

After leaving the cocoon it commences to feed externally, crawling everywhere and often suspended from the leaves by a silk thread. While feeding it lies stretched out at full length on the upper surface of the leaf, eating the upper epidermis and parenchyma in small patches, but leaving the lower epidermis, which turns brown. A few days after the larvae left their molting cocoons, I observed a few quite large molting cocoons. Suspecting that they might be cocoons in which the larva molted the second time, as the larvae within them were greenish and not yellow, I placed some of the yellow larvae, which had just left their mines, in a bottle with fresh apple leaves. After making molting cocoons and molting, they fed for two and a half or three days and then made a second cocoon which differed from the first only in size, being about one-eighth inch in diameter. These second cocoons are made and entered in the same

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way as the first ones, and the larva remains on its back inside them for two days, when it forces its way out, leaving its second cast-off skin in the cocoon, and goes on feeding as before. The only subsequent molt is when the larva transforms to a pupa.

Three weeks after the eggs commenced to hatch, the larvae commenced to make elongated white, ribbed cocoons (Pl. II, Figs. 2a and 2b), within which they transformed to pupae. The cocoons on a badly infested branch are placed side by side in patches on one side (the lower I am told) of the branch. The moths begin to emerge July 18th, the pupae having forced themselves partly through one end of the cocoon and there given forth the moths.

Owing to the necessity of my leaving Ithaca at this time, I was unable to continue my observations. If there is a second brood, which I think is the case, the larvae would probably be making their cocoons by the middle of September, and, changing to pupae, remain in that condition over winter. I found cocoons containing living pupae the latter part of September of 1881.

This insect has become very injurious in some localities. Scraping the trunk and cutting and burning many of the smaller branches would doubtless do some good. But other observers state that the larvae will often wander off and attach their cocoons to objects other than apple trees. In such cases the above treatment would not be sufficient. Probably the only effective remedy would be to sprinkle the foliage of the apple trees with some poisonous solution while the larvae are feeding, namely, in the latter part of June.

Below are given descriptions of the eggs, larva, and pupa; and Clemens' description of the adult.

EGG. Outline oval. Color identical with the leaf. Surface rough and iridescent. Length $\frac{1}{2}$ mm. Width a little more than one-half the length. When hatched the shell collapses and turns black.

LARVA (*after leaving the mine but before molting*). Length about 2$\frac{1}{2}$ mm. Width uniform, $\frac{1}{10}$ mm. Form cylindrical. Thoracic, abdominal and anal legs well developed. Head a little more than one half as wide as the first thoracic segment. On the dorsal surface of the first thoracic segment is a dark brown or black spot which can be seen even while the larva is in the mine. The first thoracic segment can be lengthened or

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shortened by the insect if desired. All the abdominal and thoracic segments are of very nearly the same length excepting the seventh abdominal segment, which is longer than any of the others. Depressions on the sides of the larva seeming to indicate a lateral ridge. Numerous hairs on all the segments, but small and inconspicuous excepting one on each side of all the segments. Color: light yellow, excepting the head, which is entirely brown, and the legs which are partly so.

LARVA (*after molting once*). Length about 2 mm. Body slightly narrower than before. Head nearly as wide and longer than the first thoracic segment. First thoracic segment contracted behind. The large spot on this segment has given place to an indefinite number of small spots irregular in outline, but quite symmetrically arranged. The outlines of the segments on the sides are not so rounded as before molting. The surface of the larva has drawn up into folds and tubercles. From each tubercle arises a black stiff hair which in most cases is quite long. There are six hairs on the dorsal surface of each abdominal segment, arranged in two transverse rows, four hairs in the anterior row and two in the posterior. Also two hairs on each side of the segments. The anterior margin of the first thoracic segment is whitish and furnished with about eight long hairs projecting forward, reminding one very strongly of a spiked collar. The color of the larva has changed to a green while the head has become light brown, with a dark spot on each side.

LARVA (*after molting the second time*). Length 2½ mm. and increasing to 6 mm. before pupating. Form and color as before. Markings on first thoracic segment arranged in three transverse rows. Head and thoracic segments have in most cases a reddish tinge. Lateral ridge becomes more distinct, consisting of the whitish tubercles placed close together.

PUPA. (Pl. II, Figs. 2d and 2e.) Length, 2.8 mm. Width, .7 mm. Form cylindrical. The last five abdominal segments may be drawn up in the spring so far that the hind tarsal sheaths project beyond them. Length from head to end of posterior tarsal sheaths 2.3 mm. The relative lengths of the other appendages as in drawings. Head armed with a strong, sharp, chisel-shaped beak. On each side of the anal segment is a very stout, short and sharp spine. Hairs not numerous and not readily seen. Color: black, with the exception of the ventral surface and the sheaths of the appendages which are brown.

ADULT. (Pl II., Fig. 2). Head and face very pale ochreous, with the tuft tipped with brownish. Antennae pale ochreous, dotted above with dark fuscous. Fore wings whitish, tinged with pale yellowish, freely dusted with brown. On the middle of the inner margin is a large, dark brown oval patch, forming with its opposite, when the wings are closed, a conspicuous, nearly round dorsal patch; a streak of the same hue from the costa opposite it running to the inner angle of the wing, and tapering from

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the costa where it is broadest. At the tip is a round, dark brown apical spot, and in the cilia a dark brown hinder marginal line. Hind wings pale, brownish ochreous, cilia the same. (Clemens).

Natural enemies.— From a case of this species I bred an undescribed chalcid parasite, *Eupelmus bucculatricis* Howard MSS.—

A. E. Brunn, in 2 *Rept. Cornell Univ. Exp. Sta.*

EXPLANATION OF PLATES.

Pl. I, Fig. 1. Adult Lithocolletis crataegella Clem.
" " 1a. Leaf of apple showing mine of L. crataegella.
" " 1b. Larva of L. crataegella.
" " 1c. Lateral view of the pupa of L. crataegella.
" " 1d. Ventral view of pupa of L. crataegella.
" " 2. Adult Ornix prunivorella Chambers.
" " 2a. Position of O. prunivorella when at rest.
" " 2b. Apple leaf showing mines and cocoons of O. prunivorella.
" " 2c. Larva of O. prunivorella.
" " 2d. Lateral view of pupa of O. prunivorella.
" " 2e. Ventral view of pupa of O. prunivorella.

Pl. II, Fig. 1. Adult Tischeria malifoliella Clemens.
" " 1a. Leaf showing mines of T. malifoliella.
" " 1b. Larva of T. malifoliella.
" " 1c. Ventral view of a portion of the anal segment of the larva, showing tentaculiform appendages.
" " 1d. Neuration of fore wing of T. malifoliella.

" Fig. 2. Adult Bucculatrix pomifoliella Clemens.
" " 2a. Apple twig with cocoons of B. pomifoliella.
" " 2b. A single cocoon much enlarged.
" " 2c. Neuration of fore wing of B. pomifoliella.
" " 2d and 2e. Ventral and lateral views of pupa of B. pomifoliella.

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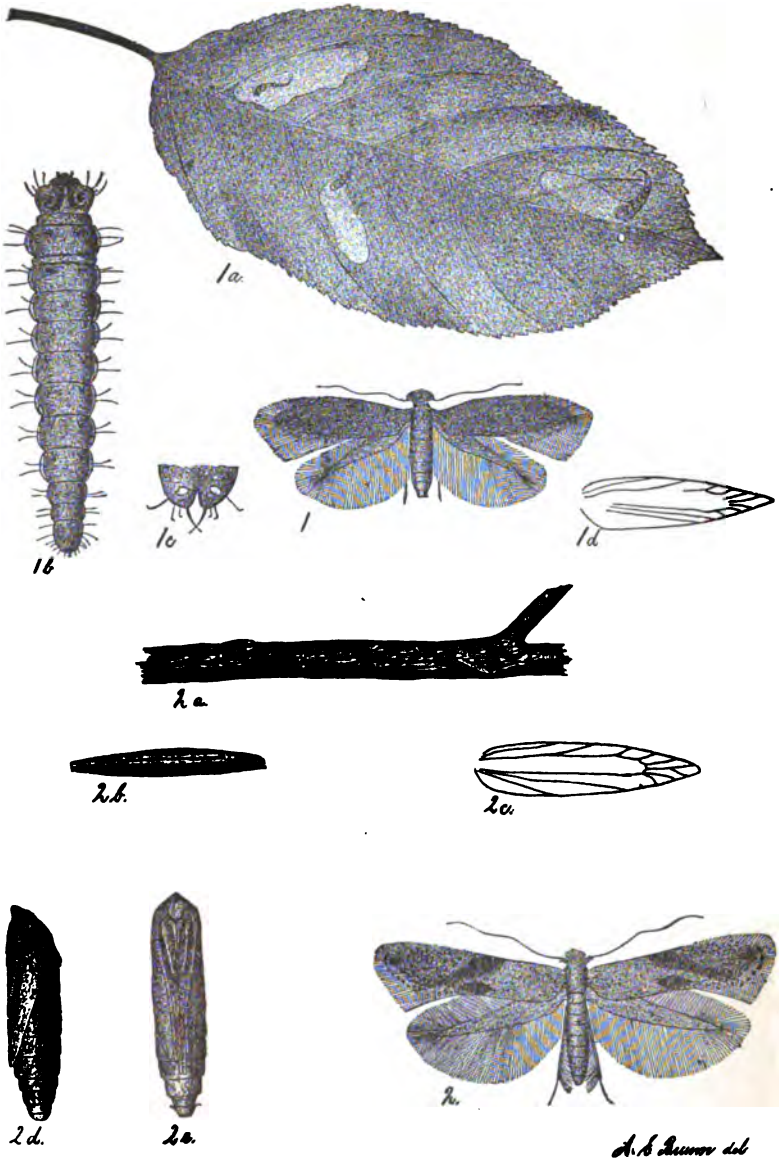

Plate II.

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Imported Holstein Friesian Cow, LADY PHILPAIL. Property of FRENCH BROS., Cincinnati, Ohio.

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THIRTEENTH ANNUAL REPORT

OF THE

WISCONSIN

DAIRYMEN'S ASSOCIATION,

HELD AT

Arcadia, Wis., February 24, 25 and 26, 1885.

REPORT OF THE PROCEEDINGS, ANNUAL ADDRESS OF THE PRESIDENT, AND INTERESTING ESSAYS RELATING TO THE DAIRY INTERESTS.

COMPILED BY

D. W. CURTIS, SECRETARY.

MADISON, WIS.:
DEMOCRAT PRINTING CO., STATE PRINTERS.
1885.

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OFFICE OF THE SECRETARY,
Wisconsin Dairymen's Association.
FORT ATKINSON, April 20, 1885.

To His Excellency, J. M. RUSK,
Governor of the State of Wisconsin:

I have the honor to submit the Thirteenth Annual Report of the Wisconsin Dairymen's Association, showing the receipts and disbursements the past year, also papers relating to the dairy interest, read at the Annual Convention held at Arcadia, Trempealeau county.

Respectfully submitted,

D. W. CURTIS,
Secretary.

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OFFICERS, 1885.

PRESIDENT.

W. H. MORRISON,

ELKHORN, WALWORTH COUNTY.

VICE-PRESIDENTS.

CHESTER HAZEN, LADOGA, FOND DU LAC COUNTY.
President Wisconsin Dairymen's Association from 1872–4.

HIRAM SMITH, SHEBOYGAN FALLS, SHEBOYGAN COUNTY.
President Wisconsin Dairymen's Association from 1875–6.

A. D. DELAND, SHEBOYGAN FALLS, SHEBOYGAN COUNTY.
President Wisconsin Dairymen's Association, 1877.

H. F. DOUSMAN, WATERVILLE, WAUKESHA COUNTY.
President Wisconsin Dairymen's Association, 1878.

Z. G. SIMMONS, KENOSHA, KENOSHA COUNTY.
President Wisconsin Dairymen's Association, 1879.

STEPHEN FAVILL, DELAVAN, WALWORTH COUNTY.
President Wisconsin Dairymen's Association, 1880.

C. R. BEACH, WHITEWATER, WALWORTH COUNTY.
President Wisconsin Dairymen's Association from 1881–2.

SECRETARY.

D. W. CURTIS,

FORT ATKINSON, JEFFERSON COUNTY.

TREASURER.

H. K. LOOMIS,

SHEBOYGAN FALLS, SHEBOYGAN COUNTY.

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ARTICLES OF ASSOCIATION.

[*Adopted February* 15, 1872.]

ARTICLE I. The name of this organization shall be, the Wisconsin Dairymen's Association.

ARTICLE II. The officers of this association shall consist of a president, secretary and treasurer.

ARTICLE III. The vice-presidents of the association shall consist of all past presidents.

ARTICLE IV. The presidents, vice-presidents, secretary and treasurer shall constitute the executive board of the association.

ARTICLE V. The officers of the association shall be elected at the annual meeting, and shall retain their office until their successors are chosen.

ARTICLE VI. The regular annual meeting of the association shall occur on the second Tuesday of April in each year, at such place as the executive board shall designate.

ARTICLE VII. Any person may become a member of this association, and be entitled to all its benefits, by the annual payment of one dollar.

ARTICLE VIII. The executive board shall have power to call special meetings whenever and at such places as in their judgment its interests so demand.

ARTICLE IX. The officers of the association shall perform such other duties as usually devolve upon the officers of like associations.

ARTICLE X. The treasurer shall have the custody of all moneys belonging to the association, and authority to pay out the same whenever an order is presented, signed by the president and secretary.

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LIST OF MEMBERS, 1885.

A.

Arnold, A. A., Galesville.
Alma Creamery Ass'n, Alma, Wis.
Austin, G. A., Neilsville, Wis.
Acerman, M., Acadia, Wis.
Ashton, Robert, Arcadia, Wis.
Allen, F. C., Eau Claire, Wis.
Andrews, N. S., Dubuque, Ia.

B.

Bach, Nick, Arcadia, Wis.
Bishop, Collins, Arcadia, Wis.
Bigham, John, Arcadia, Wis.
Bouch, John L., Arcadia, Wis.
Bowen, L. R., Bangor, Wis.
Busy, O. A., Arcadia, Wis.
Bristol & Orvis, Oakfield, Wis.
Brigham, Daniel, Arcadia, Wis.
Bamen, Wm., Arcadia, Wis.
Burt, Robert, Arcadia, Wis.
Boheri, Fred, Fountain City, Wis.
Beech, C. R., Whitewater, Wis.
Bohmstedt, John, Trempealeau, Wis.
Rennett, Wm. F., Arcadia, Wis.
Blunz, Wm. F., Arcadia, Wis.
Briggs, Harvey, Arcadia, Wis.
Boist, Virgil, Independence, Ia.
Barry, Thos., Arcadia, Wis.

C.

Cummings, Wm., Trempealeau, Wis.
Comstock, Adam, Arcadia, Wis.
Cyceska, Joseph, Arcadia, Wis.
Coromer, P., Arcadia, Wis.
Celler, F. A., Arcadia, Wis.
Campbell, W. E., Humbird, Wis.
Carswell, F. E., Lone Rock, Wis.
Clark, E. F., Galesville, Wis.
Cooper & Newell, Whitewater, Wis.
Clark & Reynolds, Hebron, Wis.
Clark, Isaac, Galesville, Wis.
Catlin, John, Greenville, Wis.
Courtney, Thos., Glencoe, Wis.
Cowie, Geo., Glencoe, Wis.
Chappel, D. D., Galesville, Wis.
Curtis, T. D., Syracuse, N. Y.
Cilley, D. C., Independence, Ia.
Cook, C. H., Independence, Ia.
Clements, Rev. C., Montana.
Crandall, Albert, East Pipin, Wis.
Curtis, D. W., Ft. Atkinson, Wis.

D.

Dixon, H. L, Arcadia, Wis.
Dressendoffic, John, Arcadia, Wis.
Dewey, D. C., Arcadia, Wis.
Davis, C. W., Ithica, Wis.
Decker, A. J., Fond du Lac, Wis.
Dusenberry, S., Independence, Ia.
Darisch, John, Arcadia, Wis.

E.

Englehardt & Doelle, Fountain City.
Eucksom, John O., Arcadia, Wis.

F.

Foster, C. M., Arcrdia, Wis.
Fish, H. Z., Richland Center, Wis.
Fargo & Co., F. B., Lake Mills, Wis.
Fish, H. E., Walworth, Wis.
Field, S., Osseo, Wis.
Fentig, J. M., Arcadia, Wis.
Florine, J., Waumudu, Wis.
Farrand, C. W., Galesville, Wis.
Favill, Stephen, Delavan, Wis.
Fereman, A., Arcadia, Wis.
Farber, Wm. J., Arcadia, Wis.

G.

Grossman, Frank, Arcadia, Wis.
Gillespie, J., Arcadia, Wis.
Gilbert, G. O., Blair, Wis.
Gorton, J. B., Arcadia, Wis.
Gibson, W. H., Centerville, Wis.
Gordon, Arthur J., Arcadia, Wis.
Gibson, Chas., Lind, Wis.
Gabney, James, Arcadia, Wis.
Ganz, J. C., Waumudu, Wis.

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H.

Higby, J. M., Arcadia, Wis.
Higby, Edward, Arcadia, Wis.
Hartman, J. Philip, Arcadia, Wis.
Hunner, L. P., Alma, Wis.
Hill, Geo. W., Editor *Live Stock Journal*, Chicago, Ill.
Hoard, W. D., Ft. Atkinson, Wis.
Holms, C. F., Trempealeau, Wis.
Henry, Robert, Anchorage, Wis.
Henry, Prof. W. A., Madison, Wis.
Haggerty, J. A., Mt. Sterling, Wis.
Hoyestead, K. K., Ettrick, Wis.
Henaid, N. T., Ettrick, Wis.
Hartman, H., Arcadia, Wis.
Hoffle, J. A., Arcadia, Wis.
Henneman, Rev. W., Alma, Wis.
Hocomb, D. L., Arcadia, Wis.
Hare, Joseph, Arcadia, Wis.
Hobart, L. D., Alma Center, Wis.
Haigh, John, Alma Center, Wis.
Hensel, A. W., Hume, Wis.
Hunner, L. P., Alma. Wis.
Hazen, Chester, Brandon, Wis.
Harper, Geo., Anchorage, Wis.
Hain, Hildebrandt & Parker, Fennimore, Wis.
Haney & Campbell, Bellevue, Iowa.

I.

Inglish, M. Arcadia, Wis.

J.

Jackson, Walter, Arcadia, Wis.
Jones, T. L., Hellena, Wis.

K.

Kellogg, Joseph, Arcadia, Wis.
Kendall, A. J., Merrillan, Wis.
Kampa, Lewis, Arcadia, Wis.
Kurtz, G., Alma, Wis.
Koenig, P. J., Arcadia, Wis.
Kerchler, J., Waumondee, Wis.
Kindschey, J., Montana, Wis.
Kindschey, Jr., C., Montana, Wis.
Kundsen, S., Arcadia, Wis.
Kindschey, Geo., Montana Wis.
Kulig, Hyacinth, Indep'dence, Wis.
Kelly, Mrs. R. Howard, 31 Major Block, Chicago, Ill.

L.

Loomis, H. K., Sheboygan Falls.
Lewis, J. D., Arcadia, Wis.

M.

Morrison, W. H., Elkhorn, Wis.
Morley, N. W., Baraboo, Wis.
McCollum, J. L., Twin Bluffs, Wis.
Mower, John, Arcadia, Wis.
Mower, Emile, Arcadia, Wis.
Menger, J. A., Fountain City,
Murphy, A. L., Hortonville, Wis.
Mills, L. B., Greenville, Wis.
Mack, C. C., Anchorage, Wis.
Massull, W. P., Arcadia, Wis.
Meyer, N. G., Arcadia, Wis.
Miller, Henry, T., Arcadia, Wis.
Maquenly, J. W., Arcadia, Wis.
Mower, D., Arcadia, Wis.
Markham, G. H., Indep'dence, Wis.
Matterson, Seward, Arcadia, Wis.
More, Wm. B., Arcadia, Wis.
Merwin, Wm., Trempealeau, Wis,
Mabie, E., Independence, Wis.
Marks, Chas., Montana, Wis.
Manley, C., Arcadia, Wis.
Meyer, Peter, Arcadia, Wis.
Mills James, Guleph, Canada.
Moyogibib, Lewis, Arcadia, Wis.
Morgan, Miss Jessie R., Arcadia, W.

N.

Newcomb, Isaac, Arcadia, Wis.
Newcomb, Harold, Arcadia, Wis.

O.

Ochsner, K., Waumandee, Wis.
O'Brien, J. O., Arcadia, Wis.

P.

Pickering, Chas., Galesville, Wis.
Perkins, C. E., Arcadia, Wis.
Perrott, Lewis, Greenville, Wis.
Proctor, Richard, Arcadia, Wis.
Peterson, M. O., Arcadia, Wis.
Pike, Andy, Arcadia, Wis.
Pierce, Henry, Arcadia, Wis.
Prate, D. J., Independence, Wis.
Peterson, O., Arcadia, Wis.

R.

Rhodes, Joshua, Trempealeau, Wis.
Radell, J. C., Arcadia, Wis.
Rogers, Alferd, Osseo, Wis.
Rathbone, Albert, Arcadia, Wis.
Rupp, C. C., Montana, Wis.
Racine Ref'ig. Co., Racine, Wis.
Rosenquist, A. M., River Falls, Wis.
Rickford & Lamson, Prairie du Sac.

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Ready, F., Montana, Wis.
Rhodes, Mrs. J., Caledonia, Wis.

S.

Smith, Hiram, Sheboygan F'ls, Wis.
Smith, J. A., Cedarburg, Wis.
Soendon, S. H., Ettrick, Wis.
Shane, D., Bangor, Wis.
Sehiback, N., Arcadia, Wis.
Sabatta, G., Arcadia, Wis.
Simpson, H. E., Home, Wis.
Sarles, Antone, Arcadia, Wis.
Simpson, Thomas, Arcadia, Wis.
Schuster, W. H., Fount'n City, Wis.
Scott, J. T., Richland Center, Wis.
Senty, Geo., Montana, Wis.
Sprecher, John, Independence, Wis.
Shaftner, J., Independence, Wis.
Sneller, Florence, Montana, Wis.
Suttie, W. J., Trempealeau, Wis.

T.

Tinton, John, Arcadia, Wis.
Tarlen, Joseph, Arcadia, Wis.
Taft, James, Arcadia, Wis.
Trim, Wm., Galesville, Wis.
Thurston, Edson, Blair, Wis.
Tripp, S. H., Augusta, Wis.
Thomas, J. M., Dixon, Wis.
Taylor, J. S., Anchorage, Wis.
Taylor, Albert, Galesville, Wis.
Thomas, James, H. Mendovia, Wis.
Thompson, W. B., Galesville, Wis.
Tibbets, E., Arcadia, Wis.

U.

Ulrick, Wm., Wamadell, Wis.

V.

Vaugarten, S. H., Schlemville, Wis.

W.

Webb, George, Arcadia, Wis.
Wood, D., Whitehall, Wis.
Williams, W. H., Eau Claire, Wis.
Wintenberga, Henry, Arcadia, Wis.
Whiffin, John, Arcadia, Wis.

Z.

Zeigenwied, Adam, Glenco, Wis.
Zeller, Philip, Alma, Wis.
Zeller, Frank, Arcadia, Wis.

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THIRTEENTH ANNUAL MEETING

OF THE

WISCONSIN DAIRYMEN'S ASSOCIATION.

PROGRAMME.

TUESDAY.

11 A. M. — Entry of Butter and Cheese and articles for exhibition.
2 P. M. — Organization of Convention.
Address of Welcome by Hon. J. B. Gorton, Arcadia.
Response by W. D. Hoard, Fort Atkinson.
Opening Address by President Morrison.
Appointment of Committees.
Report of Secretary and Treasurer.

"What Shall be Done to Promote Better Dairy Education Among Our Farmers?"—J. D. Lewis, Arcadia.

This subject is certainly one of great interest to every one who keeps a cow, and Mr. Lewis will no doubt be able to point out the right road to travel.

"What Shall We Do With the Skim Milk?"—Stephen Favill, ex-President Wisconsin Dairymen's Association, Delavan.

Mr. Favill is one of the pioneers in the cause of Wisconsin Dairying, and is still in the harness. What he has to say will be based on many years of valuable thought, observation and practice.

"The Value of Pure Milk."—H. Z. Fish, Richland Center.

Mr. Fish is the enterprising proprietor of several Cheese Factories, and has had thorough training in both New York and Wisconsin. He will speak of what he knows.

"Is it Desirable to Establish a Dairy School?"— C. R. Beach, Ex-President Wisconsin Dairymen's Association, Whitewater.

Mr. Beach is one of Wisconsin's closest thinkers on agricultural topics. His own success as a farmer and dairyman is sufficient proof of the value of a sound farm education, and what he has to say should be weighed long and well by all who hear him.

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"Our Necessities."—Hon. A. A. Arnold, President State Agricultural Society, Galesville.

Mr. Arnold will be able to speak as one having experience in the progress of the northwestern portion of the state. His thoughts cannot fail to have a general as well as local significance.

"Do Hard Times Give us the Right to Doubt the Profitable Results of Good Dairying?"—J. A. Smith, Dairy Editor Cedarburg "News," Cedarburg.

Well trained both in journalism and dairying, Mr. Smith will be able to present the "word and the deed" of this topic in a most instructive manner

"The Home Side of Farming"—Miss Jessie R. Morgan, Arcadia.

Miss Morgan will be able to show the cheery, bright spots in the daily farm life, which are not found in any other vocation.

"Don't Sell and go West, but Emigrate on your own Farm."—Hon. Hiram Smith, Ex-president Wisconsin Dairymen's Association, Sheboygan Falls.

A man like Mr. Smith, who can take 200 acres of land and make them support a larger number of cows, and pay a larger profit than one farmer in a thousand, can not fail to tell something worth hearing.

"Individual Differences in Dairy Cows."—Prof. W. A. Henry, State University, Madison.

Prof. Henry has given this topic much thought and experiment. It is these "differences" that go to make the sum of profit and loss. Every man who keeps a cow for else than fun, should be present and listen to the Professor.

"How Shall the Farmer Better his Condition."—C. H. Cooke, Dover, Buffalo Co.

This is a question always present in the pocket, if not in the herd, of the farmer. To solve it successfully means better homes, happier families, wiser farmers, and more prosperous communities. Mr. Cooke's ideas will no doubt prove a help in the right direction.

"The general Purpose Cow."—W. D. Hoard, President Northwestern Dairymen's Association, Fort Atkinson.

No man has studied better than Mr. Hoard, the value of a good cow, and what it is that creates that value. The claim so often set up that dairymen want a cow for her final value to the butcher, and that the "scrub" is as good as any other if only fed well, will be discussed without gloves.

"What Does the State Owe to the Agriculturist."—Hon. Chester Hazen, Brandon. Member of the Legislature.

Mr. Hazen's early identification with the dairy interests of the state,

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and his prominence in agricultural matters for many years, has given him strong vantage ground from whence to view this important topic.

"Cheese Factories and Cheese Makers, as I find Them in Wisconsin."—T. D. Curtis, Syracuse, N. Y.

Mr. Curtis was employed part of the past season by the Wisconsin Dairymen's Association, to instruct cheese makers how to make a better article of cheese. Himself as a practical cheese maker, we shall enjoy in this adddress the rare felicity of "seeing ourselves as others see us."

WEDNESDAY EVENING.

Dairy Banquet and Sociable.

PREMIUMS OFFERED ON BUTTER AND CHEESE TO BE EXHIBITED DURING THE CONVENTION.

CLASS I.—PREMIUMS ON BUTTER.

The Association offers the following premiums on butter:

For the best tub or pail of butter	$10 00
For second best	5 00

CLASS II.—PRINT BUTTER.

Best specimen or plate of butter made into fancy prints	$5 00
Second best	3 00

CLASS III.—GRANULATED BUTTER.

For the best sample of granulated butter	$3 00
Second best	2 00

Granulated butter may be exhibited in fruit jars.

CLASS IV.

Geo. S. Hart & Co., produce commission merchants, 38 Pearl St., New York, offer a prize Silver Cup valued at $100, to the manufacturer of the finest quality of full cream cheese.

Competition for same to include all makers of factory cheese complying with the rules of the Association.

Prize to be retained by the winner for one year, then to be returned to the Association for renewed competition.

The maker who is awarded the cup for three successive seasons, to retain the same permanently.

The Prize Cup is of Sterling Silver, satin finish, with gold border and lining. Upon one side of it is engraved the figure of a cow, and upon the

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reverse side an appropriate inscription. This cup is also enclosed in an elegant satin lined case.

It has been won by A. H. Wheaton, Auroraville, 1878; Olin & Clinton, Waukesha, 1879; W. S. Baker, Cold Spring, 1880; H. A. Conger & Son, Whitewater, 1881; August Klessing, Centerville, 1882; Marr & Dyer, Whitewater, 1883; and E. P. Ingalls, Milford, 1884.

RULES GOVERNING THE EXHIBITION.

1. Entrance fee to be fifty cents for each.

2. Butter made at any time, and to be in packages of not less than eight pounds—a small pail—except in classes 2 and 3.

3. Butter in *Stone Jars* not allowed to compete for premiums.

4. No package can compete for more than one premium.

5. Scale of points for judging cheese: flavor, 15; quality, 15; texture, 10; salting, 5; color, 5. Total, 50.

6. Scale of points for judging butter; flavor, 20; grain, 15; salting, 6; color, 6; style of package, 3. Total, 50.

Manufacturers, Dealers and Inventors are invited to make an exhibit of Dairy Goods in which they are interested. A committee will be appointed to examine and report on the same.

Parties wanting Cheese and Butter Makers for next season, and those wishing situations, will find Books for Register, that the wants of each may be known.

Arcadia is on the Green Bay, Winona and St. Paul R'y. It is 22 miles east of Winona, and 44 miles west of Merrillan Junction. It is reached by the C. & N. W. R'y, and C., M. & St. P. R'y from Winona and from Merrillan Junction, on the Northwestern Road. The distance either way is about the same.

Members paying full fare one way, will be returned at reduced rates.

W. H. MORRISON, President, Elkhorn.
H. K. LOOMIS, Treasurer, Sheboygan Falls.
D. W. CURTIS, Secretary, Fort Atkinson.

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TRANSACTIONS

WITH

ACCOMPANYING PAPERS AND DISCUSSIONS,

OF THE

Wisconsin Dairymen's Association,

AT THEIR

THIRTEENTH ANNUAL CONVENTION.

Held at Arcadia, Trempealeau Co., Wis., February 24th, 25th and 26th, 1885.

The thirteenth annual convention of the Wisconsin Dairymen's Association, convened at Muir's Hall, in Arcadia, Tuesday, February 24, at 2:30 P. M., President Morrison in the chair.

Song by the Glee Club.

President Morrison introduced Hon. J. B. Gorton, who welcomed the convention to Arcadia in the heartiest manner, as follows:

Mr. President, Ladies and Gentlemen of the Dairymen's Association:—I am delegated by the citizens to welcome you to Arcadia, and this being the first time your honorable body have decided to come so far north and west, to do some real needed missionary work, it makes it easier and pleasanter for me. The character and object of your association are not wholly unknown here, but are as a whole but imperfectly understood. The industry you are organized to promote is coming to be one of the leading industries of the state and of the whole north and west, and it is in a large measure surplanting wheat raising, which was and is now quite the leading industry, not only of this, the northwest part of our state, but of this whole Northwest Territory.

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Although Wisconsin has ranked high as a wheat producing state, the agricultural citizens, as a whole, have not succeeded in making more than a living, and I think fully one-half of them have made a complete failure, as far as a financial success goes, and have been sold out by the mortgagee and sheriff, and joined the multitude of tender feet and gone to the new West to do the same thing over again.

It was under this condition of circumstances that induced a few of our leading citizens to make a strong effort to induce your honorable body to meet with the producers of this northwest and see if we could not obtain some knowledge of the ways and means by which you have been enabled to so successfully overcome the difficulties of the situation in the more southern and eastern part of our common state. As you will observe, we are of somewhat mixed population, but our needs are the same; we had a few settlers from the New England and central states, and some from the earlier settled western states, and the few Europeans who were raised in the dairy districts, have been trying to carry on farm dairying to some extent, but they are so isolated from each other, that there has been but little concentrated effort to work in unison, and as a matter of course have not succeeded in demonstrating to themselves and to their more skeptical neighbors, and other fellow citizens, the full benefit of successful dairying, as we expect it will be shown by those here who have had more successful experience, and have been induced to come to impart that knowledge. It has been very difficult so far not only with the private dairymen, but also with factories, the few who have started, to get anything like a uniform or satisfactory report of sales, for some cause, which I think your honorable body will be enabled with past experience to show us the reason why and perhaps point out the remedy. We are fully satisfied as a whole, that there must be some other way for us to make a living and success in getting something more than wheat raising, but so far, with few exceptions, we have not succeeded in convincing our producers that the dairy is the way out, and now we believe you will be able to do so, either by getting such laws passed as will protect good honest

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goods, or as the report comes to us, as it occasionally does, of how to procure and properly proportion, suiene or oleoine, so as to compete with city dairies.

There seems to be but little demand for first-class goods at fair prices, except the demand to supply aforesaid city dairies. I will quote from commission merchants' circulars, and it is a very uniform report: For choice and fine fresh makes of creamery the demand continues fair, and for such the market remains steady and firm. All stock, however, not choice and not suitable to the wants of the butterine manufacturers dull and neglected. We hope you will be able to solve the problem for us, so we can meet successfully this competition. Whether the stuff is wholesome or not, is disputed. Some of the leading dairy papers say it is, others say it is not fit to eat, being filled with all kinds of impurities and seeds of disease, but it seems that it can be produced so much cheaper than the genuine article, and leave so large a margin of profit to the manufacturer, that legitimate dairying cannot successfully compete with manufacturers of the patented article; and it looks now as though there was not much to encourage legitimate dairying, or to the increase of dairy stock, and our producers will have to look to some other source of income to eke out an existence. We think that there would really be a demand for more butter and cheese than the present dairy stock of cows in the country could supply, and at fair prices, if we had the city dairies out of the way. And now the way out. We hope you will be able to point out the proper and legitimate road. Do we need legislation, and if so, how are we to procure it?

The old maxim that in union is strength, we see demonstrated all around us; that is a union of moneyed interests. We see all trades and professions have their associations and guilds to consult for their best common interests, and we hope that your association will be enabled to solve the problem for the producers of dairy goods. In all cases where trades, professions and transportation companies ask for legislation in their special calling or business they usually get all they ask for and how is it with the producer. When

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he petitions for the passage of laws that will help them to retain a small portion of the products of their labor, so as to enable him to provide the necessary papers and books, and to give him time to read and inform himself as to his want and the position he occupies, they are usually told that they do not know what they want, or that they get more than they deserve, and so far as my observation goes, whenever he does try to organize, he finds all manner of obstacles thrown in his way, and lacking confidence; by being usually kept under by straightened financial circumstances and the results of his former legislators, who he has sent to represent (as he supposes) his special calling and interests, that as a whole he has come to the conclusion that he is born to be a hewer of wood and drawer of water, and to spend his life and that of his family, for the support of and to accumulate moneys for what seems to be growing in republican America, the favored classes. To illustrate, we suppose that the dairyman and stock raiser is interested in protecting his herds from contagious diseases, and our representative cattle men got up such a bill, and presented it to congress for action, with what result? The commission men and Union Stock Yard Co., of Chicago, got the best lawyer that Chicago afforded and sent him to Washington, to get the bill so amended or altered, that it proved to be of no practical benefit to the interests it was calculated to protect. The above is only a fair sample of the legislation that producers usually get whenever they ask for any.

We think that the men with the experience, who live nearer the centers of population, and are able to judge of the public pulse, will be able to give us such advice and information, as will enable us to see more clearly than we now do, our way out of these difficulties, and also enable us to compete successfully with city dairies. And now ladies and gentlemen of this association, recognizing you as representatives of one of the leading industries of the state, we again bid you welcome, and trust you may have an interesting and profitable session, and the remembrances which you may carry away, may be pleasant and profitable.

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RESPONSE TO ADDRESS OF WELCOME.

By W. D. HOARD, Fort Atkinson.

Mr. President, Ladies and Gentlemen of Arcadia, and Members of the Association — I thank your representative, Mr. Gorton, for the kind words of welcome that he has bestowed upon the association in behalf of the people of your city. It is not often, Mr. President, in the history of this association, now meeting for the thirteenth time, it is not often, if ever, that we have seen the first session of our annual meeting greeted with an audience like this. It speaks well for the interest that is being manifested in the agricultural heart and mind, the hunger for knowledge, the disposition to study, the endeavor to understand. It also tells another story. In the faces of many of these farmers before me, I read the study of long years of unavailing effort, the study of long hours of toil, unrequited toil, wasted endeavor, and the fruitless striking out into the air for comfort and home, and for emolument, all gone down the remorseless maw of wheat culture. It all speaks well, gentlemen, that when an organization of this character comes before the people, that it is greeted with such an interest.

This organization has heen a traveling farmers' institute, meeting only once a year, but it has been, in its history, one of the most beneficent of any that has ever been organized in any state in the Union. Look at what it has done; when this organization first started in 1872, six or eight gentlemen alone met in the city of Watertown to organize it. The general product of the state of Wisconsin at that time was worth about $1,000,000. To-day the cows of Wisconsin produce $20,000,000, worth of product. Not only that, but thousands of mortgages have been lifted from beleaguered homes, hundreds of farmers in this state to-day are living in comfort, where poverty stared them in the face and their families—a dark and disconsolate prospect.

When I reflect upon the slow accretion of ideas growing up under the influence of this organization, and how large

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a number of farmers in this state have only heard of it as something that happened away over there on the east side of the state, and which was not for them. When I reflect upon this, Mr. President, and see how steadily it has gone forward in its beneficent march, doing its good work, I feel to-day proud of the little humble effort that I have made in connection therewith.

I tell you, my farmer friends, the day has come when the mind must go ahead of the hand. We have before us, all over this country, men with hard hands and weak heads, that is the wrong way of putting the question. We had much better have hard headed and soft handed men, for with those fortune is best assured. I am reminded when I think of Wisconsin agriculture of the condition that an Irishman found a man in traveling through the woods. He found a man sunk in a morass, and he rushed over to where a Yankee was chopping wood near by; says he, "For the love of God come over here quick, as fast as you can, here is a man sunk in the quicksand." "Ah! Is that so, how far is he in?" "Bedad sir, he is up to his ankles," replied Pat. "Oh well, he'll get out, if only up to his ankles." Aye, begorra, I forgot to tell ye he went in the *other end furrsht.*"

The difficulty has been, that we have gone wrong end first, we have swamped the head, my friends, when we should have kept that clear. You know no living man can drown with his head above water; now dairying is a thing that is the work of brains, the work of study, or rather the quickening of the mind, and the application of good principles and good thinking. It comes from good study and the action of the mind. It is not a work of main strength. Ole Bull traveling through Ireland, going through Donny-Brook fair, discovered an Irishman sitting on a barrel, fiddling for dear life and the sweat running down to his heels. Ole Bull says, "Do you play by note?" "Divil a note." "Do you play by ear?" "Divil an ear." "How do you play then?" "By main strength, be jabbers." That is the difficulty. We have all been playing, not by note or by ear, but by main strength.

The blessed spirit we enshrine and call the cow, teaches

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us better. She tells us that from the laboratory of her body there comes a delicate fluid, we call milk, we make cheese and from out this elaboration we make fortunes. The wilderness is made to blossom, we stand side by side with life, not with death. No man can live with a cow and treat her decently, that is not a broader and a better man at the end of the year.

Now then, the Wisconsin Dairymen's Association has been almighty hungry to come up here for a long time, you haven't sent us an invitation, and we didn't want to come unless we were invited, but just as soon as you did invite us, we nearly broke our necks to get here; now that we are here, you have given us a hearty, earnest welcome. If we can do you any good, God bless you.

Stephen Favill called to the chair.

OPENING ADDRESS BY PRESIDENT MORRISON.

Ladies and Gentlemen: I congratulate you this afternoon upon the favorable circumstances with which we are surrounded upon this, the thirteenth anniversary of the Wisconsin Dairymen's Association. I am glad of the opportunity of extending a cordial greeting to so many of the older members of this association, and equally pleased to welcome so many who are strangers.

The same spirit of inquiry and investigation that necessitated the organization of this association is with us still. Observation and experience have taught those who have attended our conventions that they have energized and stimulated the dairy industry of our state far more than all other causes combined. The times are demanding a broader and more intelligent class of farmers. To secure success, brains are a necessity upon the farm and in the dairy. "Nothing succeeds like success." Every year of prosperity and success in our chosen vocation places our business upon a firmer and more remunerative foundation, encourages

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those engaged in it to extend and grow, giving their undivided effort and attention to its prosecution. Infuse some individuality into your work. Make yourself part of your business. Our homes — the farmers' homes — are furnishing a steady stream of recruits to the cities. The intelligent, active and energetic are absorbed by the professional and commercial classes. Habits of industry, frugality and economy, coupled with the wealth of a well-developed physical organization, are sure to succeed.

Knowledge is power, and he who breaks away from farm isolation and mingles with his fellow-man in a convention like this will be benefited in proportion as he takes a part in its discussions. For this purpose, and to give us enlarged ideas, and to relate actual experience, we have met in convention.

The importance of dairy and stock farming to the well-being of this community is well indicated by your presence. There is a wide field for improvement. I dare say none of us do as well as we might.

Let each of us endeavor to make ourselves a part of this convention. If we have a question to ask, or an argument to advance, let there be no hesitation. All are invited to take their full share in the deliberation, and while the details that will lead to profit and success will take up much of our time, let us not forget the important factors which make up the home life of the farmer. The home, the wife, the boys and girls, all of our toil, and the comforts and luxuries it gives, are for them, and, as one by one they leave the old farm to go out into the world, may their recollections of that home be bright and happy, the best monument ever reared to a parent's memory.

PRESENT CONDITION OF DAIRYING.

Although the prices for dairy products have not ruled high in 1884, yet, comparatively speaking, it has been a prosperous year for dairymen. That large class who are always fearful that some great calamity is about to overtake us, and who have been predicting that the bottom would drop out of the dairy business, are becoming weary in wait-

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ing, and one of them recently wrote to one of the largest, and a very successful factoryman, and requested him to send his recipe for making cheese. As long as men endowed with so little common sense can be found that are not aware that intelligence, skill and experience are necessay for the production of butter and cheese of superior excellence, just so long the only surplus will be products of an inferior quality manufactured by this class.

The future outlook is full of hopefulness, but we must aim to make the best. A high standard of excellence is the product that wins and invariably demands remunerative prices.

Wisconsin at the present time has more than 560,000 cows, producing annually 30,000,000 lbs. of cheese, and 38,000,000 lbs. of butter. The yearly product foots up to over $20,000,000. Our dairy industry has become a great industry, and its marvelous growth has been steady and healthy, because it has been profitable. Probably no business venture to-day offers better and surer returns for the capital invested than the dairy business.

Our conventions heretofore have been held in the pioneer dairy counties, but, receiving a cordial invitation to visit this part of the state, the executive committee of the association thought it would be to the mutual advantage of all interested to accept your kind invitation. We have with us this afternoon many of the best dairymen of the state, dairymen that have a national reputation; successful dairymen, who are making their cows earn from $70 to $90 each for the season. You will have an opportunity to hear papers, addresses, and discussions from these men. All of them are ready and willing to speak of the faith that is in them, and by their organized effort and effective work Wisconsin dairymen have been enabled to win more laurels at New Orleans than any other state. No opportunity has ever been lost by them to make a creditable show. Entirely to the Wisconsin Dairymen's Association is due the magnificent show of dairy products from this state, taking eighty-two premiums amounting to $3,371, and two gold medals, no other state taking over twenty-six premiums, amounting to $1,589. No legislature convening last winter, the exhibit had

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to be worked up and means contributed by the members of this association, who had confidence in the merits of Wisconsin butter and cheese.

An effort to secure an annual appropriation from the state of $1,000, and to increase the number of the reports of the association to 5,000, bound separately, will probably, through the earnest recommendation of Gov. Rusk and the liberality of our legislature, be granted, thereby disseminating much valuable information in the best and most approved methods of manufacturing butter and cheese.

What are the most serious difficulties in the way of our future prosperity? Here is an extract that I noticed in a paper only a few days ago:

"Consumers of oleomargarine will be astonished to know that many of the hogs dying of cholera and other diseases are sold to soap boilers. Soap grease, scientifically deodorized, is considered a palatable fat by the manufacturers of adulterated butter."

One would naturally think that the amount consumed of this nauseous compound would be small, but the production is enormous and is largely on the increase.

Live cows cannot compete with dead hogs. It is a contemptible business, and all who feel an interest in our dairy industry are compelled to admit that there is a way, and we have a right to demand of our legislature that if men devoid of soul and conscience will palm off cholera hogs' lard for butter, that stringent laws whose penalties cannot be escaped, will compel them to sell the filthy product for what it is.

Have we any besetting sins or temptations in the dairy business?

The Great Master said: "He that is without sin let him throw the first stone." I shall throw no stones, but merely propound a few questions.

Have we banished the skimmer from our cheese factories? Can a full-cream cheese be made from skim-milk? Can you say boldly, fearlessly and without hesitation, "Yes, sir; they are full creams." Are we exercising all of the cleanliness, care, and skill in making the best butter and cheese

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that can possibly be produced? I trust that the deliberations and discussions of this convention will be characterized by its harmony, good will, a spirit of inquiry, and to accomplish the greatest amount of useful, practical information in the time allotted.

I cannot close without expressing, in behalf of this association, its sincere thanks to the entire press of the state, for the courtesy and kindness displayed in the favorable notices that have appeared in their columns, without charge, of this convention. To the press, as dairymen, stock breeders or planters, we owe much of our present success and prosperity. Let us give them our hearty, cordial support.

MR. S. FAVILL — *Ladies and Gentlemen:* I am very glad to be here; I am glad that I was one of the very few that helped to organize the Wisconsin Dairymen's Association. I am very glad to know of the good results which it has wrought for us in parts of the state in changing from the plow to the cow.

It has done wonders for us, and I am glad to be able to tell you that you may do the same with a certainty of success. I have attended every annual meeting of this association, with the exception of perhaps one or two, and I have, as Mr. Hoard says, never seen so large and intelligent an audience as we have here, the first session, and it makes me sure that you are in earnest in this matter whatever is the cause. I don't know that it matters so very much, what is the cause, but I speak of this because you have been trying to raise grain, and sell it in the market until you have exhausted your bank; as long as you continue to deposit in your bank, you can continue to draw upon it, but stop the deposits and see how long your checks will be honored. You carry on your farm year after year, and you take your products away year after year, and after awhile it is all gone. Haven't you been doing that in Trempealeau county? With us in Jefferson county, twenty years ago, the farm that did not have a mortgage upon it was a rare thing, and to-day it would be a very rare thing to find a farm

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that has a mortgage upon it, and for no other reason only that we substituted the cow for the plow. Mortgages have been lifted, we have good comfortable homes, and very many of our farmers instead of borrowing money are money lenders, not quite so much just now, because we have had low prices for this year, but a year ago to-day in the very town in which I lived any amount of money could have been gotten at five per cent. on good security. And the cow will do for you just what she has done everywhere, where she has been kindly treated.

Now I am glad you have come here to consider this matter, and the best way to get the very best results out of it, is to make it your own. There are a few of us "old heads" that have come up here and I might stand here and talk an hour, and I might say everything you did not want to hear, and fail to say that very thing that you wanted to hear, but if you will fire the questions at me from all parts of the house, if I know enough, I will answer you and in that way you will get the information that you want. Just remember that so far as I am concerned (and I believe it is so with the rest), we came here, firstly: Because we wanted to come and visit you, and then we wanted to do you a little good if we could, and the way to get it out of us is to draw. Now if there are any questions I would like to have you ask them.

Mr. Gorton — Will Mr. Favill tell us what he knows about clover?

Mr. Favill — Any ground that will grow corn, oats and wheat, will grow splendid clover, and it is the very best crop that can be raised upon the farm, without it is corn, and I think it is a little more valuable than corn. Do you know that clover is the very best thing to fatten hogs upon, besides making milk. On our farm last year we made every acre of clover worth $25 by letting the hogs eat it. We did not have to cut it, or do anything to it, but let the hogs eat it, and made it worth $25 per acre, by feeding just a little corn. We turned fifty hogs into a ten acre clover field and they made, after paying for the corn and all, over one hundred pounds on each hog on clover; I sold the hogs

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at $5.50 a hundred. Raise clover, it is very much better for your milk than any other grass, but cut it early, don't wait until it is old; after it is old it isn't much better than straw.

Mr. President — Tell us how you make your clover hay, how do you cure it?

Mr. Favill — Put it in the mow and cure it there, cut it green and tumble it into a big mow in a tight barn. Close the doors, don't let any air in, keep all the air out, and let the clover cure in there.

If you don't put some straw on the top, it will be rotten down six or eight inches, put a little straw on and then when you come to get down below and take it out, your clover will come out as good as it went in.

Question — Do you mean to say, not dry it at all?

Mr. Favill — No, sir; I wilt it a little, I have heard of barns burning, but I never saw it myself, and have yet to see the man who has seen such a thing. I know of a case where hay got so hot that the man was afraid it would burn the barn, and pitched it out, and that is as near as his barn came to burning. You must be careful about it; if it is wet, full of water, and the ground is full of water, you must dry off the water or the dew. A great many make that mistake. It must not be cut and put up while the dew is on, but let it dry so there isn't anything but the juices of the grass, put it in the mow and it wont burn up. I have put in hay so green I thought it would spoil myself and it got so hot that I got frightened about it, but I never have had any burn yet. Hay wants to be put in while the juices of the hay are in it, when it is green enough so it will pack very tightly together, then it excludes the air, it keeps its own heat, and drys itself by its own heat, and it keeps all the virtue there is in it.

Question — Does it not become moldy?

Mr. Favill — No sir, if it is wet it will, if it has got water on it, it will be some moldy and burn and turn white, and perhaps get afire, I don't know.

Mr. Hoard — Did you ever notice Mr. Favill, that cattle will eat it even when you would call it spoiled?

Mr. Favill — Yes, I have, the first I put in Mr. Carswell, of Lone Rock, if I would put it in and try it that way, he would

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pay me for all that burned up. He was older than I, and so I tried it, and thought when I saw it put into the barn that it would spoil, but it did not. It got very hot, but it did not burn, and when I came to feed it out, the cows that were giving milk, done just about as well as when running out in fresh pasture. I would mow the clover down in the morning after the dew was all off, and put up in a cock in the afternoon. Be sure it is all done before the dew can fall on it or rain. I would leave it there one day, turn it over, and then put in the mow. It won't be dry, but will be sufficiently wilted. Whereas if you let that lay out in the sun and get dry, and turn it over two or three times and put it in the barn, it would be just about as good for the cows as pea straw. You want to put something on top to catch the moisture, or the top of your hay will be spoiled.

Question — Do you use salt on your clover hay?

Mr. Favill — No, I don't think salt does any good to keep hay, it is mostly water. It may have a tendency to make the cattle eat it better.

Question — What do you do if your cattle bloat from eating green clover?

Mr. Favill — About the handiest thing is spirits of turpentine, to an ordinary animal I would take five or six table spoonsful with a little water or milk and turn it down. I have seen many animals that were bloated from eating green clover so that in a minute or two they would be dead, saved by tapping. They will stand up as long as they can and fall down dead if they are not relieved. I have seen them after they fell, stuck with a knife so it relieved them, it blows the gas off and relieves them. That is a little dangerous, I always have a little spirits of turpentine handy. I have heard of lots of other things, fastening the mouth open for one thing. If you let the cattle run in the clover when it is wet with dew in the morning, they are liable to bloat, and I have even had one or two die in the afternoon when everything was dry.

The President — Several years ago I had twenty or thirty head of cattle running in a clover field, and a Prussian I had working for me, came in one day and told me that one of

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the younger ones had died with bloat, and he had applied a remedy that he had used in Prussia to the others. He had one of the hired men to hold the animal by the horns, he then took hold the tongue and merely drew it to one side. He went through the entire herd and saved them all in that way. Some had fallen down when he did this, and there was, of course, a great escape of gas.

Prof. Henry — It is well for a person to understand the cause of an animal dying. The reason is this. The paunch, or the first stomach being so extended with gases, the abdomen being limited in space, the paunch is pressed forward against the lungs and the animal dies for want of breath. If you keep that in mind, you remove the cause at once. but the farmer must be careful when he thrusts the knife into the animal. When he takes it out again the gas follows the knife, and if the opening is not very large, the opening in the stomach will allow the gas to follow the knife out, but when as the knife is taken out the coating of the stomach draws past the opening in the skin and the gas fails to pass out. By putting a goose quill in after the knife you can keep it open until the gas passes out.

Mr. Favill — If you can't find a goose quill take two sticks, cut a good large slit with the knife, put in the two sticks and leave a hold between, and you will let the gas out and give the animal a chance to breathe.

Mr. Clarke — We would like to know where you would make this slit in the animal.

Mr. Favill — The paunch lies upon the left side. Right at the point of what we call the short ribs, just right between the ribs and the hip about half way. Stick your knife right down into it. It won't do any hurt, and mind that it is kept open.

Mr. Clement — I know a woman whose husband has been in the grocery business, so she has attended mostly to the farm business. They were troubled a good deal that way, and she would always take a knife along and cut a little hole and turn it a little and hold it open, and she would save the animal every time.

Mr. Favill — I have heard farmers say, that if cattle run-

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ning in a clover pasture could have a chance at a straw stack or dry hay, that they would never be troubled.

Mr. Thomas — Would this remedy apply to sheep as well as cattle?

Mr. Favill — I should suppose it would, I have never tried.

Mr. Clement — I don't think it would kill sheep; I have tapped several and it didn't kill them.

Mr. Hoard — Mr. Charles Phillips, of Lake Mills, was one of the most successful farmers that Wisconsin ever produced. He amassed before he died $100,000 in straight farming, and that means success. It was a common practice with him to take some of the farms that wheat farmers had mortgaged up and sold out, and it was invariably his practice, and is the practice of his brother to-day, never to sow a spoonful of grain under any circumstances without sowing a good liberal amount of clover seed with it. He said to me one time, "Clover is cheap when you think what it does." It is the cheapest manurial agency that ever went onto a farm, and when we reflect that according to Liebig, that clover takes seven-tenths of its bulk from the atmosphere it is cheap. No matter what Mr. Phillips sowed, clover went in with it; then he said he had this advantage, if in the spring certain pieces that he had anticipated seeding down proved they were not fit, he had his choice, and even if he ploughed right up again the next spring, he said that the clover was worth four or five times as much as the cost of the seed in renewing and fertilizing the soil.

Mr. Gibbon — What is the value of clover as feed for hogs, when dry, cured?

Mr. Favill — I haven't tried to winter any exclusively, but I always make a practice when I have some nice early cut clover, to give them a little and they eat it well. I suppose clover put through a cutting machine and steamed, and a very little meal put with it is splendid to winter hogs on.

The President — I wish to make one statement in reference to the renovating power of clover. In the southern part of the state, in Walworth Co., in about all of the leases that are made, this stipulation appears, that every acre of small grain that is put in shall be seeded with clover. On a neigh-

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boring farm, the man had impoverished his land so that he was only getting about eight bushels of wheat to the acre, and I think about half of that was pidgeon grass. Since that he has clovered his land and now he is producing good crops of wheat. Of course he follows diversified farming.

Mr. Chapman — I want to know what to do with corn stalks, is it worth while to cut them up at all?

Mr. Favill — I think it is, but men that know fully as much as I do, think they are not worth cutting. But I should say, you want to run every one of them through a cutter, have a power cutter that is large enough to cut it about as fast as a man can feed it and cut it up, it will go so much farther. Several years ago, I had an old horse power, and we cut up everything we fed, well, there was eight or nine acres of our corn that didn't get husked in the fall, and the result was that instead of having to buy fodder, we turned off that many acres of stalks in the winter, and I am sure that if I hadn't got that cutter and cut up these stalks, I would have had to buy more fodder than that cutter cost.

Prof. Henry — Mr. Chairman, at the experimental farm, we are trying several experiments to determine the value of corn fodder. Our first experiment is this, and the figures roughly are these. Four acres of land turned off 14,000 lbs. of corn stalks, and fifty bushels shelled corn, to the acre, making 200 bushels shelled corn to the four acres. Two cows were fed corn stalks and two other cows good mixed hay. These cows were fed for three weeks in that way, then the experiment was reversed. The result we found, was that one pound is worth two pounds of corn stalks. Now if land will yield 14,000 lbs. of stalks from four acres, you see it is about nearly two tons of stalks to the acre, you see then that an acre of land besides producing fifty bushels of shelled corn, will produce 1¾ tons stalks, and if it takes two tons of stalks to equal one ton of hay, and 1¾ is worth nearly a ton of hay, then we have got a ton of hay to the land besides fifty bushels of shelled corn. We are experimenting now with clover hay.

Mr. Hoard — Do you find any difference in the flow of milk when fed upon stalks or hay?

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Prof. Henry — Each cow produced during the experiment whether fed upon hay or corn fodder about a pound of butter per day, and the corn fodder gave an equal amount with the hay.

Mr. Hoard — How many more pounds of corn stalks would your cow consume, than pounds of hay?

Prof. Henry — Two to one in bulk, but then she wasted stalks, the waste on feeding dry corn stalks is about forty per cent. You see in making these experiments, we can not feed a cow to get the most out of her. We have to feed whatever we are trying now a farmer feeding to the best advantage should feed some hay and some corn stalks. Mr. Beach (who should be here to-day), after listening to one of our experiments last year, said: "Well, I am glad to learn that science is confirming common sense." And that is what we have been able to do in this case. I think our farmers are very careless with their corn stalks, if four acres can produce 14,000 pounds corn stalks, they can figure up what their land should do.

Question — Have you made any experiments with corn, ground in the ear?

Prof. Henry — Prof. Sanborn has carried on a large number of experiments on that, and he finds that the effects are in no way deliterous. I should say in general, that the cob does not add a very great amount, but possibly if your machine is so arranged you had better grind them together and one good effect is, that it keeps the meal apart in the animal's stomach.

Mr. Hoard — In your experiments with corn fodder, have you determined how many pounds can be raised to the acre?

Prof. Henry — Yes, but I can not carry the figures, it is about 30,000 pounds green stalks, there is about twenty-three to twenty-five per cent. of water, I have 42,300 pounds, but with southern corn, 33,000 from northern corn.

The President — In our farming, are we not more careless in the care of our corn stalks than of any work on the farm?

Prof. Henry — There's corn stalks enough wasted in Wisconsin every year, to keep every four footed animal that eats fodder or hay.

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Question — Will corn stalks help the land if they are left uncut?

Prof. Henry — Yes, there is no doubt of it, that is a question that has to be studied, but there is no doubt that every bit that goes under the land helps to lighten it. I wish to go on record here as against the use of this large southern field corn. I have raised corn fodder that weighed from five to seven pounds to the stalk, it is nice to talk about, but I don't think such large stalks are so good as the small stalks.

Mr. Case — Would you kindly tell us what in your judgment is the relative value of eastern corn raised in this part of the country, as compared with our western corn, is it worth while to raise eastern corn here?

Prof. Henry — A chemical analysis shows eastern corn to have more nutriment per one hundred pounds than western corn, quite a little difference in favor of the eastern growth, but that eastern corn brought west soon becomes western corn. I think at this altitude a farmer should grow some flint corn. I think that the farmer that grows southern fodder corn or most any kind of corn for early fall feeding, will find it greatly to his advantage. No corn pays so well as that planted early and cut early, for an acre of corn fed early in the fall, in September and October, is worth two acres fed in January and February.

Mr. T. D. Curtis — Do you think that eastern corn becomes western corn unles there is cross fertilization?

Prof. Henry — Yes, just as an eastern man becomes a western man.

Question — What can a man afford to pay for bran, with butter at 20 cents a pound?

Mr. Favill — If he has got a cow giving milk and has not any other feed, he had better pay $12 a ton than have her dry up. I want to utter my protest against corn cobs. They are very nice for making a fire in summer for the ladies, to make a cup of tea, but they are no good for grinding up, it is almost sure to be imperfectly ground and imperfectly digested. Take your feed corn or middlings and you will get

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almost twice the benefit from it, if you will mix it with cut clover hay. Feed the two together.

Mr. Hoard — In our county good dairymen have discovered this fact, that it always pays to give a cow anything she wants, I don't care if it was an Indian. If she wants an Indian she shall have it. She is queen in that county. Give the cow a variety, and if you haven't a variety, suppose you buy it, and in turn the cow will give you more and better milk. Then there is another thing men do not think of. The man that buys bran, buys manure of wonderful richness, and our heavy feeders are making money in the investment. Our farmers are getting so rich, for instance, Mr. Millard says his farm is getting so rich he don't know what to do with it. His hay and grain is all lodging. He has been making money hand over fist in the dairy business, selling his butter in New Orleans and getting a good price. He buys largely of bran.

Mr. Hiram Smith tells me his farm is getting very rich under that treatment. The idea of buying bran for feed is simply to keep up the variety in the feed, to keep up the healthy condition of the cow, for as she is the most healthy, she is the most profitable.

Question — What breed of cows are you using down there, where your land is getting too rich?

Mr. Hoard — We have a good many Jerseys and have a good many Holsteins. As yet our dairymen are cursed with this beef notion; they are getting out of it somewhat. The men who are making butter are largely getting into Jerseys and Guernseys, they are the most profitable butter cow we have.

Question — How about the Galloway?

Mr. Hoard — The Galloway is worth as much for dairy purposes as the hog.

Mr. Favill — The best breed I know of is a good large bin of mill feed, good warm stables, good pure water and most excellent care; these are the best breeds I know of.

Prof. Henry — Before the afternoon session comes to a close, I want to remind you all that this association needs money to discharge numerous expenses incurred in connection

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with this convention, as well as the small, but yet necessary regular running expenses. You are all invited to become members by giving your names to the secretary and giving him one dollar. In return, besides discharging a pleasant duty, you will receive far more than the equivalent of that one dollar. You will get a full report from the secretary, just as soon as it is published, containing not only all the papers read here, but all the discussions, the questions and answers. Moreover, those of you that have come from any distance and have had to purchase railroad tickets, will, by becoming members, be entitled to a rebate of four-fifths of your return fare.

Mr. Favill made his customary offer to refund a dollar for every copy of the report returned to him with the assurance of the owner, that he did not think it worth one dollar.

Song — "As I'd Nothing Else To Do."

Convention adjourned to 7 o'clock P. M.

EVENING SESSION.

Met pursuant to adjournment, at 7 o'clock P. M.

President Morrison in the chair.

THE VALUE OF PURE MILK.

By H. Z. FISH, Richland Center, Wisconsin.

In dealing with this subject to-day, it can not be expected that many, if any, new and original ideas will be advanced for it is a subject in the development of which experts in all ages of the world have lavished their time, talent and means. But if I suggest any one new idea, even though an erroneous one, it will at least serve to elicit the comments and the criticisms of others more scientific and practical than myself, who may adduce the result of correct experiments, and will, in doing so, become public benefactors and further the object at issue.

Science demcnstrates that there is a close elementary relationship between animal and vegetable growth; that they

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are merely the harmonizing of a very few primary elements, namely, carbon, oxygen, nitrogen, and hydrogen, of some of which the greater part of the universe is principally composed. Pure milk contains all of these elements in combination, and seems to be an essential connecting link between the vegetable creation and the final development of the mammiferous animals, among which man is classed. In treating the subject, I will first take the ground that the purity is essential to the keeping qualities and healthfulness of milk as an article of food. A healthy fatted calf, a tub of fine butter, or a first-class cheese, can not be made out of impure milk. Purity is the prerequisite to inviting and desirable dairy products. Then we would naturally inquire: What is pure milk and how shall we obtain its greatest value? As I understand, it is not proposd that I shall give the market value of products made from tainted milk, and delivered in Chicago and New York markets. The manufacturers of such goods have their customers, and they are either traded off at the village groceries or sold on the market at a price anything but remunerative to the producer. Therefore, it is profitable to know the causes of impurity in milk, and how to arrest or avoid them. Some of these causes may have been induced by agencies so subtle that they can not be traced by any ordinary skill.

Nervous, magnetic and sympathetic causes are among that class, and have their potent effects. Among the more common causes are impure water, improper food, poor management or care, unhealthy condition of the animal, etc. Such milk is bad to begin with, and is lost by maternal inoculation, putrefaction, and decay. Milch cows, the stock upon which the dairymen of this state most depend to get their groceries, pay help, taxes, and raise the mortgage from their farms, are sometimes poorly bred or selected, and most shamefully neglected, turned out to graze on short pastures, or fed upon poor hay, watered at a frog pond or at the terminus of a cesspool, poorly sheltered or not at all, chased, excited, and bitten by dogs, pounded by hired men, not milked dry or regularly, barely supplied with enough food of any kind to keep up the animal economy, much less to

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yield any good, wholesome, rich milk. The dairyman who allows his stock to be cared for in this way will soon find that dairying will not pay. There are many vegetable substances which, although not particularly uncleanly of themselves, should not be fed to milch cows, such as cabbages and turnips; decayed vegetable matter of any kind, such as decaying apples, potatoes, etc.; sour whey, swill, fermented substances of any kind should never be fed. Often one cow's mess of poor milk will contaminate the mess of the entire dairy, and that, all which it is mixed with at the factory. Cows feeding on a rank growth of clover will cause a gassy, open curd, which, if not handled with great care, will make spongy cheese. Sometimes in the spring, cows will eat leeks or wild onions, which make the milk very obnoxious to the sense of smell; unburied, decaying animal or vegetable matter, an uncleanly building, filthy yard, or neighboring yards near which the milk is stored, improperly cared for milk tools, wagons, etc., any of these will seriously affect the purity of milk.

To remedy this slackness among farmers in taking care of their milk before bringing to the factory, I would suggest that the factorymen in every county in Wisconsin draw up an article of agreement, and each and every factorymen pledge that he will not receive any tainted, adulterated or impure milk from any patron, and if such is brought to his factory he will either return such milk or punish such patron to the fullest extent of the law, and that he will not receive any milk or patron into his factory, who shall leave or be turned out of a neighboring factory from any cause or complaint from the neighboring factory, and after a patron once begins to carry milk to a factory he shall not be permitted to carry to any other factory during that year, unless he presents letters from the owner and officers of the first factory stating that his milk was pure and satisfactory while he drew to that factory. Unless this or something similar is promptly done among the factorymen of Wisconsin we shall be, and are now in some localities, afraid to send a man's milk home when it is tainted and unfit to be mixed

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with the bulk at the factory, for fear he might be offended and go to a neighboring factory with his milk.

Some farmers will neglect their milk and bring it to the factory in poor condition, the cheese-maker will scold about it, but does not dare to send it back for fear of loosing a patron; he makes poor cheese for all his patrons, takes about ten per cent. more milk to make a pound of cheese than he should, thereby oftentimes making less cheese than he would had he thrown away the poor. There are patrons who will take milk to a factory just as poor as they can and not have it returned. This condition of things should be stopped and unless it is, Wisconsin dairy goods will in a few years be of inferior quality on account of adulterated or poorly cared for milk.

Milk is not only a ready absorbent of decaying animal and vegetable taints and odors, but also of the germs of contagious and infectious diseases; scarlet fever and typhoid fever have been spread by the use of infected milk. It has even been stated by good authority that the condition of a mother's mind has caused her milk to produce convulsions and even fatal hœmorrhages in her nursing child.

Feed nothing to milch cows except what is well and properly cured, or fresh and sweet. Keep the stables clean and well ventilated; milk neatly and at regular hours. Aerate the warm milk by dipping, then set it in cold water, or a cooler of water in the milk, and change the water as often as it warms, until the temperature is reduced to about 60°; never place a tight cover over the can, but leave at least eight inches between cover and can for a free circulation of air; store it in as clean, cool, airy a place as possible. Wash the milk tools as soon as you are through using them, first in warm water, then scald them thoroughly. Some one suggests we must have very little pure milk. What shall we do with the impure mass? I have hinted at the way it is sometimes disposed of. Prof. T. D. Curtis says feed it to the hogs; but who knows that that would work well as a general rule; we would question the propriety of making even pork out of spurious milk before disinfecting it. Bring none to the factory but such as has been well made, neatly

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milked and thoroughly cared for, and you will have no occasion to censure the manufacturer of butter and cheese, or put a low estimate upon your property invested in the dairy business.

Cow's milk, which is about the only kind that enters into the dairy products of this country, forms a very essential part of human sustenance, being adapted to every state and age of the body. This secretion designed for the use of the young animal, contains every ingredient found in the human body, and is the most healthy, nutritious and cheapest article of food known. Man can live on milk alone, unless he has been addicted to the use of spirituous liquors. In its manufactured state, as in cheese, it has nearly three times the muscle-growing and nutritious properties that beef has; so that the laborer of England buys it at from fifteen to twenty cents a pound.

DISCUSSION.

Mr. T. D. Curtis — In my travels through the state of Wisconsin last summer I visited a number of factories, and I wish to say that those run by Mr. Fish were as intelligently run as any that I visited anywhere. His cheese-makers were all intelligent men, and they are all instructed to operate in the same manner, and their product was quite uniform in the different factories. Mr. Fish comes from a family in Herkimer county, New York, noted as dairymen, who make splendid cheese, and perhaps he has inherited some of his good qualities in this direction, but in addition to this, he has been observing and industrious and studious, so that he has been able to go to New Orleans and carry off a large share of the first premiums, $500, I understand, and the grand sweepstakes and gold medal. He is a good example to any of you young men who are thinking of going into the dairying business.

Mr. Hoard — Mr. Fish, can you give us the average profit, or rather product per cow of the patrons of these several cheese factories the past season?

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Mr. Fish — I cannot give the average, but I can tell what the different patrons say they receive from their cows. Between $40 and $50. In some places where I have started factories entirely new and the people are entirely unacquainted with the business of buying cows, it has been only from $20 to $35 in about six months. The largest factory in Bear valley will return about $50 per cow. I think last year the cows netted, after paying all expenses, $55, to several patrons in the valley.

Question — How many months constitute your season.

Mr. Fish — Nine months in the valley, and in some of these other places six to eight months.

Question — In those factories running nine months, does it give any opportunity for butter making besides?

Mr. Fish — They sometimes begin to make the 1st of October, but in none of my factories; I understand it is very profitable.

Question — Then out of a good fair cow, with good management and care you calculate a man should make $50?

Mr. Fish — Yes, a year ago, I had the figures, what it costs the patrons to keep their cows, a good many of them, but I have not the figures now.

Questions — Some of your patrons have received larger net returns than what you have mentioned?

Mr. Fish — Yes, sir.

Question — Can you name some of the largest amounts?

Mr. Fish — No, I only know the average.

Mr. Hoard — Do your patrons feed anything to their cows except fresh pasture?

Mr. Fish—They don't until the feed begins to grow short, but there are some factories that are making butter this year, through the winter; by so doing have a very much larger yield, and are getting more money from their cows than those that have been making summer goods, and in Wisconsin there are many patrons that will net even $70 for their cows in the course of the season, but don't know any one in our neighborhood that will do that, because we only milk in summer, at which time milk is always abundant, and cheese generally low in price.

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Prof. Henry—What does your milk bring the patrons per 100 pounds for the season?

Mr. Fish—Somewhere between 75 cents and 90 cents for those six months. For nine months it will run between 80 cents and $1.

Prof. Henry—I was in Polk county the other day, and they said "our factory has netted us $1 per 100 pounds during the season; is that a good result?" What would be the answer?

Mr. Fish—That would be an excellent result for this year; it has been a dull year for cheese.

Mr. Foster—Can you estimate approximately what percentage of loss there is to the product of the factories from bad milk?

Mr. Fish—Well, the loss from bad milk from my factories has been very light, because I tell my cheese-makers in the first place, that if one drop of bad milk comes to the factory, to send it right home again, if the patron leaves the next morning.

Question—But thereby the patron loses his milk?

Mr. Fish—He does, if he brings bad milk.

Question—What I want to know is, how much better off is a factory that puts in good milk all the time?

Mr. Fish—You can make about ten per cent. more cheese out of milk that is good and pure, all right, than you can out of milk that is somewhat tainted, and it will work off faster. Sometimes in the summer when it is very hot, bad damp weather, and thunder showers, it will take over eleven pounds of milk to make a pound of cheese, when perhaps in three days from that you can make a pound of cheese out of ten pounds of milk. It is very essential that patrons should pay more attention to the condition of their milk. In a good many places they lay all the blame to the cheese-maker, if there is poor cheese. It is a very poor cheese-maker that cannot make good cheese out of good milk, but it takes an *extra good cheese-maker* to make *good cheese* out of poor milk.

Mr. Hoard—Do you think any cow can give good milk that does not have good water to drink?

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Mr. Fish — I do not, I can give a little experience of my own. One year I was troubled in the factory, with what we call floating curds. I could not understand why it was, I took samples and examined each patrons milk, and I found all of the milk on a certain stream was poor. It would come to the top of the glass tube after standing a while and the bottom would look like water, showing that the milk itself floated. Then I wanted to know what was the cause of it. I took my fish pole and went down the stream one day, when I got through a little early, and above where all these patrons were drawing milk, I found a calf that had been drowned and had been there perhaps ten days or two weeks, and as soon as that was removed from the creek, all the trouble in the factory ceased.

Question —How do you ascertain that the milk is tainted?

Mr. Fish — I can easily tell by smelling it or by heating it a little. If they have any doubt about the milk, I have the cheese makers heat the milk, and then they can detect very quickly by the smell.

Mr. Hoard — Don't you think that if all the patrons of all the cheese factories in Wisconsin were, by some dispensation of Providence, compelled to fence their cows away from all stagnant pools of water, that it would enhance the value of cheese in Wisconsin fully one cent a pound.

Mr. Fish — I think it would.

Mr. Hoard — In this connection I wish to say, that right in the county of Jefferson where the gospel according to the dairy is preached, one day last summer I saw a dairy of about forty cows and the total water supply that those cows had was a stagnant pool of surface water filled with all manner of filth and the cows standing belly deep in it, in the middle of the day, and that man, when I expostulated with him said, "Why the cows like it better than well water." I said to him, "Why, don't you know that they like it for the reason that it is warm?" A cow likes warm water; the maternal function of giving the milk makes a cow very sensitive to cold, so a man should have his water pumped and have it set in the sun where it can be warmed a little.

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Question — If we are going to enter into the dairy business here, we want to know how much it is going to cost?

Mr. Fish — It is almost impossible to keep a correct account among our average farmers; they say, "I guess about so much." In New York they pay just about double what you do here for bran and corn, grain of different kinds, and they feed quite extensive on grain. Hay is nearly what it is here, and they think there is no other business that will pay them as well as dairying. If they make it pay there, why can't we, where we have just as good water as there is on the green earth, and a great deal better grass than they have.

Question — How much would it cost to keep a cow, feed and hay, besides the pasture?

Mr. T. D. Curtis — It depends something how well you keep her. It would take two tons of hay and all the pasture she wants. Some six or eight years ago, I read a paper before the American Dairymen's Convention, in which I took the ground that any cow that gave less than 3,500 pounds of milk, which would make 350 pounds of cheese at ten cents per pound didn't pay her keep. The paper caused some discussion. Mr. Harris Lewis said it cost him $40 a year to keep a cow. The Utica Herald printed an article, in which they stated, they had sent all over the dairying country and collected a range of estimates; $15 I think being the lowest (I would hate to be that man's cow), and some running as high as $50, but the average, when struck, was exactly $37.50, or $2.50 more than I estimated it. I think that is a pretty fair estimate of a cow's keep in central New York.

Question — How much less will it cost to keep it in Wisconsin?

Mr. Foster — One third less.

Mr. Curtis — About $25 is low enough, ain't it?

Mr. Favill — About $10 too low.

Mr. Curtis — I would rather put the other $10 on, if I were a member of the herd.

Mr. Favill — You want the extra $10 put on if you want to make anything from the cow. It takes a certain amount of feed to support the carcass of the cow, and if you haven't

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anything more than that, you haven't anything in return. You can not run the machine for less than about $20, and if you only just run the machine, you don't get anything out of it, but suppose you run a machine that costs you $20, and then put in $20, extra fuel, and you are going to get something.

Mr. Hoard — C. P. Goodrich, of Jefferson county, is an average farmer, but he is a keen man and a very intelligent man, and a man who ciphers. He has got a herd of fourteen cows, grade Jerseys. He is a farmer living out where an ordinary farmer says you can't do anything with a Jersey. There is no good beef in them. His herd of fourteen rade Jerseys produced for him last year in butter-making, as a private dairyman, shipping his butter to Chicago and selling it on its merits in the open market through a commission man, $84.49, I think, per head. He estimated the cost of keeping those cows at $35, leaving him something like $49.49 profit per head, after paying for every item of expense. Well, now Mr. Goodrich is this sort of a man: He is liberal with his cows, he is careful with them, he never allows anybody to race them, or chase them, or do anything wrong to them whatever, the best water, the best feed and gentle care. He says when he looks at a cow and recognizes in that cow that the giving of milk is a maternal function and that she stands before him in her feminity as a mother, he feels that the man that would dare strike a mother, is a "son of a gun." Old Uncle W. C. White, of Kenosha, one of the kindest men, had a dairy of seventy cows, which brought him in 6,000 pounds of milk. He uttered this aphorism, which I have heard, laughed at, and I have heard it quoted in one of the agricultural journals as one of the shrewdest in the country: "I always speak to a cow as I would to a lady." Now, the secret of old Uncle White's success is this. I went around his farm and saw just how he managed. He had seventy cows. I went there as a stranger. The cows didn't pay any attention to me. There was no idea among them that anybody was going to hurt them.

The old man went out in his calf pasture, he had a dozen calves and they gathered about him, you could see the

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affection those animals had for him, you could see the kindly sympathy that existed between them. Now, that was not all humanity, it was sound good business sense. The cow is the most sensitive animal that we have on the farm, particularly if she is high bred. She deserves the best treatment and she answers nobly at the milk pail. I have heard men talk a good deal about improved breeds of cattle, and I have wondered whether we hadn't better get up an improved breed of dairymen; we need it terribly, we need an improved method in which men shall treat their cattle on the farm.

Mr. Favill — Way back before this association was formed, in the old Northwestern Association, Mr. White was telling us about his feeding and I asked him "how much do you feed your cows, Mr. White?" "Why, I feed them pretty well." Well, but says I, "Mr. White, one man would call a quart of bran a day, pretty good feeding, another would call four quarts pretty well, and another eight quarts, what do you mean by pretty well? He says, "I'll tell you how I do. I get a bushel-bag full and put it on my back, and I go in front of the cows and I give each one just about as much as I think she will eat." And that was the way he got 6,000 pounds of milk.

At an agricultural convention in Madison in 1872, this same Mr. White gave his experience as a dairyman, I think he said he had about sixty cows, and his cows averaged him that year about $70 each. He said he gave them a peck of feed a day; four quarts in the morning and four quarts at night, summer and winter, when they were giving milk. He dried them off in the fall, and let them go dry about three months, and yet they averaged him $70 each for about nine months' milk.

Prof. Henry—It is only the farmer that keeps a record, that knows what his cows are doing; he can tell by consulting his record whether it will pay to feed his cows. I don't think it would pay to force a cow to eat anything else, when the grass is succulent and plenty in June, but at other times, I think it is absolutely necessary. The idea of giving the cow all she wants is the correct one. If we can impress

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upon the farmers of this section, this one idea, it will be worth all that this convention costs over and over again. I have heard men say they got so much with so little feed. Those men are sharpers of some kind. He is trying to take something from that cow that he doesn't give. If you just take home that idea, we shall feel that some good has been done here.

Mr. Favill—The question is here, will it pay to feed in the summer? It is to increase the number of cows you can feed upon the same pasture. Suppose you have thirty cows on a pasture, by feeding a little each day, you can put forty cows in the same pasture and carry them fully as well as the thirty without the grain; so you have the forty to give milk and increase the milk of the thirty, too; you can see where the profit comes in.

Mr. Tripp—You say heavy feeding to dairy cows is good sense, but you can take cows running to grass, feed them with corn-meal and spoil the cow; she will give gargity milk. You can spoil the best cow that runs by over-feeding. I have spoiled a number.

Mr. Hoard—How many of your neighbors spoiled their cows that way?

Mr. Tripp—Not many.

Mr. Hoard—Don't a good many more spoil for want of feed, than from too much?

Mr. Tripp—That is certain, but there's reason in all things. No cow can give good milk without the proper kind of feed, but you can overdo it.

Mr. Favill—That is true, a cow is nothing but a machine, I would work her to the extent of her capacity without straining the gear.

Mr. Tripp—How long will the machine last if you work it that way?

Mr. Favill—I don't care how long it will last, it pays while it is running, after she is worn out sell her for beef. From the time she is four years old until she is eight, get what you can out of her then sell her for beef.

Question—How much would you get for her if she was a Jersey?

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Mr. Favill — It would depend upon how big she was. The Jersey will give much richer milk, you know, than the Holstein, and the beef is just as much better as the milk is richer.

Mr. Austin — I have had a little experience in summer feeding, and I know that no man can afford to milk cows after the feed begins to shorten without feeding them grain. During the month of June, and perhaps the early part of July you won't need to feed grain, but you will have to begin then.

Mr. Favill — Instead of her eating all the grass she can eat, wouldn't it be better to give her something else.

Mr. Austin — Undoubtedly much better for the cow, but I don't know where the profit can come in. You certainly want a cow to be a good feeder. In selecting a cow, I would select one that eats the most. In fact I don't want a light eater for a dairy cow at all. The question is, how much will she eat and assimilate. So much as she will assimilate, so much will she give in the pail. At the same time you are doing this, you are enriching your land all the time. If a man cuts off the product he is raising and sells it, he is drawing upon his capital and it will soon be gone. I believe it has come to this in this valley, that a change must come.

THE HOME SIDE OF FARMING.

By MISS JESSIE R. MORGAN, Arcadia.

How blest the farmer's simple life!
How pure the joy it yields.
Far from the world's tempestuous strife,
Free 'mid the scented fields.

How true is this stanza. How much it says in those few unassuming words. Perhaps none can tell how much there is in it until experience points out to them each truth, and proves that it is a truth. How blest is the farmer's life! Blest, because it is pure and upright, admitting of no

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hypocricy and deceit; entirely aside from the grasping, avaricious, and too often dishonest life of the business man.

How pure the joy it yields! What joy is there so pure as the joy produced by the consciousness of not only one day well spent, but every day well spent; spent in dealing with honest mother Nature, where there has been no cheating, nothing but what one is willing the whole world should know. In this kind of joy there are no troublesome twings of conscience making little interruptions when one is trying his best to be joyful.

Far from the world's tempestuous strife! Now, my friends I hope you will not imagine, because I said that experience must point out these truths and prove them, and now I am trying feebly to do it myself, that I, as a matter of course, consider myself an equal of experience. No, indeed, that is not my object, but if with my humble pen I succeed in pointing out any of the facts or proving them, and then you consider how much more powerful experience is, you will surely believe it without giving experience an opportunity to teach you.

How much of the worlds tempestuous strife as spoken of does the farmer escape! In fact all of it. On his farm he is secure and contented. His life is not one round of perpetual worry and fret about whether the markets are up or down, whether this or that speculation will be a success or failure. There is not a continual strife between himself and all the outside world; no angry, resentful feelings because his neighbor has the best custom, has secured by stratagem the bargain that he was trying to drive, his neighbor's family dress better than his own, ride in a better carriage or live in a finer house. No wonder the business man gets to wearing continually around his business establishment or around his home, that weary, tired look, that speaks only too plainly of the constant worry and struggle within. The troubles that he has may be little things, and one alone, as we look at it would appear unessential, but these little frets and troubles come manifold and daily. They prey upon him and rob him of health and peace. Well may the farmer congratulate himself that they are not his lot.

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Now we come to the last line of our stanza, Free 'mid the scented fields. Here we are at last in the country. What is the strange sensation that passes over us? Can it be the sense of freedom that we have just acquired? Is freedom such a priceless boon then? Can you ask it? Then you have never experienced it in its full sense. On a farm is health and independence. What would any of us exchange our health for? Surely nothing else could give us so much actual comfort as good health. Without it we are not prepared to fully enjoy any of the other comforts of life, unless it be freedom of opinion and independence. No place is so conducive to health as the country, where the pure, fresh air and quiet, peaceful life can rest and strengthen both body and mind as nothing else can. Then has not the farmer true independence? He is not dependent upon anyone for his daily bread. He raises everything on his farm that is needed for his sustenance. If farm produce is low in the market, he can keep his until the prices suit him better. He will not starve as long as he has good flour, meat, potatoes and other products of the farm at his disposal. He knows moreover that his store of eatables is all genuine. He goes to the city and takes his seat at the table of a hotel. He tries to make himself believe he is pleased with the appearance of the table, it is so showy, but when he falls to eating, his high opinion begins to weaken, and he heartily wishes himself at home, where instead of that greasy stuff in the butter dish, is a ball of genuine, golden butter, actually manufactured from cream, and then too, instead of the scant supply of that bluish fluid in the cream pitcher is a generous amount of that horrid yellow scum that rises on country milk and is so obnoxious when first seen to the young child reared in town, especially in the vicinity of the town pump. He goes home contented with his lot, and well may he be for none are better off. When he wishes to treat his friends to fruit, instead of sending to the store and getting fruit that has lain, nobody knows how long, he kindly invites them to the orchard to look around and help themselves. How much more delicious and enjoyable is this fruit picked by their own hands. And so I might go on enumerating the varied

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and numerous advantages of farm life, but for fear I shall make too great a draft upon your time, I will bring my paper to a close. Enough has been said. If I have gained one point in favor of farm life, I am content. If I have impressed the truth of the situation upon one mind, I am satisfied. A happy good night then to you all.

WISCONSIN FARMERS! DON'T SELL OUT FOR THE PURPOSE OF EMIGRATING TO CHEAPER LANDS, BUT EMIGRATE ON YOUR OWN LAND.

By HON. HIRAM SMITH, Sheboygan Falls.

I have nothing to say against people emigrating from crowded cities into the open country. No word of blame for families leaving thickly settled localities in the older states to find homes in the new, neither have I the slightest complaint to make against the oppressed of foreign countries, who have failed to resist successfully against the encroachments of tyrannical rulers upon the liberty and property of their subjects. Such emigration is wise and commendable, for there is connected with it a double blessing, one for the emigrant's family and their posterity, and another for the country in which they settle. But for a Wisconsin farmer to sell his farm for the purpose of emigrating to a new country, at the present time, seems unnecessary and unwise. What is the real significance of emigration at all? In the case of the classes referred to, it is to escape from conditions detrimental to their progress and happiness; opportunities for bettering their conditions are extremely small in cities, the difficulty of obtaining remuneration for capital and labor expended on the high priced land in the older states, the burden of taxation, the difficulty of the working farmer owning land at all in most of the monarchial governments of the old world, the certain draft for military services on all the able-bodied young men, too often to support governments they abhor, or worse yet, to be sent on foreign campaigns in which they can have no interest, satisfaction or

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benefits, as is the case at the present time with France and England, said to be the two most enlightened Christian nations of Europe, now engaged in bloody wars—France with China, where retaliation is the massacre of unoffending missionaries—and England with the Arabs, along the banks of the so-called "Sacred Nile" where large numbers of men are killed on both sides and very few prisoners taken, showing that the Black Flag is still in the ascendant.

What interest have the farmers of England, Scotland and Ireland in the Arabs, either in opening a camel communication between Karti and Khartoum, or whether in the future the Khedive or the "False Prophet" shall continue to rob and keep in ignorance the Arabs of the future?

All the disadvantages of crowded cities, of populous states and the aggressions of tyrannical governments, are powerful incentives and justifiable reasons for emigration, that being the only practicable remedy for the evils they have to endure. But none of these evils attach to the farmer of Wisconsin. Population is not overcrowded; remuneration for capital invested and labor performed, is ample. Taxation is light when we consider the provision made for the education of our children in common schools, colleges and universities, and the many charitable institutions for the care of the unfortunate. Human life is as safe, and the rights of property is as well protected, and civil and religious liberty on its broadest gauge universally accorded and accepted, as it is anywhere in the habitable globe.

What real reason then, is there for a Wisconsin farmer to emigrate? The one standing reason given by those that desire or intend to emigrate, is that they want more land so as to increase their productions, and this is more in the nature of an excuse, than a reason, for in nine cases out of ten, the object can be obtained without emigration, and this is the main point I wish to urge. That emigration on your own land means to adopt such a system of farming as will increase the capacity of the farm to produce dollars' worth of products, and at the same time increase the fertility of soil, and the two achievements are inseparably connected, if any permanent advantage is obtained.

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It may safely be assumed that there are very few farmers in Wisconsin that farm for the fun of it; nearly all are anxious to make the most money possible without letting their farms run down. Experience is considered more valuable than theory, and as the annual meetings of the Wisconsin Dairymen's Association, are "experience meetings" you will pardon me if I give my experience in emigrating on my own land about twelve years ago. Like most dairymen in the state, I was keeping as many cows as the farm would pasture and raise hay to winter them on. It was called poor farming to buy feed to keep stock. The custom was among all farmers at that time, and by nine-tenths of them still, to feed little or nothing to cows during the pasture season. As all pastures get short in July, if no fodder corn is raised or clover field provided for July and August, the only resort is to turn into the meadows. My experience is that a herd of say fifty cows on a two hundred acre farm will eat all the grass that grows on the whole farm from July to winter, if fed no other feed, and the cows allowed to have, as they usually do, the whole range of the farm. About this system of dairy farming, every dry season there are two certainties about it; one is, there is certain to be too little grass for the cows while consuming it, and certain to be less hay on the meadows the next season. It is as certain to make a meadow poor by over work and under feed, as to make a horse poor by the same process. One-fourth of the meadow, if clover, as it should be, if cut and hauled into the stable and fed to the cows, a portion twice each day, would do the cows more good than to wander over the whole of it, to eat some and waste the balance, leaving three-fourths of the meadow to cut the second crop for winter feed. If I state in the order that experience convinced myself, I should say, that the first emigration on your own land is, "Never pasture your meadows."

Another measure of equal importance and closely connected with the waste of too much pasture is the waste of most of the coarse fodder that grows on the farm, such as straw and corn-stalks. No one needs to be told not to waste good bright early cut hay and grain, but nearly all farmers

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waste a large part of their coarse fodder. All the valuable experiments in cattle feeding bear uniform testimony that good hay, corn meal, oil meal and bran, when fed together, make an unhealthy and an unprofitable ration, but a mixture of straw and corn-stalks would add largely to their value.

Prof. Sanborn, the Dean of Agriculture in Missouri, has demonstrated the past year, that corn ground with the cob, pound for pound, made more beef than clear corn-meal, both experiments having an equal amount of fodder. Every observing farmer knows that if the straw and corn-stalks (usually wasted in Wisconsin) were properly saved and run through a feed cutter, and mixed with nitrogenous food, sufficient to make a proper ration, the gain would be immense, and the second emigration would read, "Never waste the coarse fodder that grows on the farm."

From the little experience I have had in under draining, leads me to conclude that a thorough system of under draining on old or wet lands, would be a cheap method of largely increasing production, and would be an almost certain protection against either a protracted rain or drouth. Any measure that will utilize or save the waste of products, or will in the aggregate increase productions, enables a farmer to increase the amount of stock he may keep, which in their turn will increase fertilizing material, that one essential necessity to keep up and increase productions. The farmer should treat his farm as he is obliged to treat a bank, he must make deposits before he can check out money, and he should not forget that he must deposit fertilizers on his farm in order to check out profitable productions. Another reason why the farmer need not emigrate from Wisconsin is, that more than one-half of the state is not yet occupied. Only forty-eight per cent. of the acres of Wisconsin have ever been cultivated. Here, then, is ample opportunity to make or create good farmers' homes in Wisconsin.

Prof. Henry — I understand our good friends of Arcadia have prepared a banquet and if there be any profits arising

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from it, they will go to the high school library. The object is a worthy one, and I hope to see this room packed to-morrow night.

Song by Glee Club.

Pres. Morrison -- The convention will now adjourn to meet at 9 o'clock to-morrow morning.

MORNING SESSION, February 25, 1885.

Convention met pursuant to adjournment at 9 o'clock A. M.

President Morrison in the chair.

APPOINTMENT OF COMMITTEES.

The president appointed the following committees:

Resolutions —
W. D. Hoard, Fort Atkinson.
J. A. Smith, Cedarburg.
Prof. W. A. Henry, Madison.

Dairy Utensils —
Prof. W. A. Henry, Madison.
J. B. Gorton, Arcadia.
H. Z. Fish, Richland Center.

Dairy Exhibits —
G. A. Austin, Neillsville.
H. K. Loomis, Sheboygan Falls.
F. B. Fargo, Lake Mills.

On Nominations —
Stephen Favill, Delavan.
F. B. Fargo, Lake Mills.
W. D. Hoard, Fort Atkinson.

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CHEESE FACTORIES AND CHEESE-MAKERS AS I FOUND THEM IN WISCONSIN.

By T. H. CURTIS, Syracuse, New York.

No ordinary task has fallen to my lot in addressing you on this occasion. My peculiar mission through the dairy sections of your state, last summer, gave me some experience and some chance for observation, which may enable me to give a few hints of more or less value. But I fear you expect too much, and may feel somewhat disappointed in what I have to say. I am no magician, I possess no Aladdin's lamp, and never pretended to have the gift of working miracles. Yet from some things I have heard and read, I have become impressed with the idea that the popular opinion is that an expert in cheese-making is capable of defying all conditions, or of instantaneously changing them to just what is desired. I have never met such an individual, though I have met many of the leading cheese-makers of the country, and all who have a public reputation as experts. If such exist, I should be most happy to meet them.

I have never seen the best of cheese-makers who could always hit just right, even in the factory, where he was supposed to understand all conditions and surroundings, and with the machinery and apparatus with which he had daily familiarity. Much less have I seen one that could go into a new factory, and at once have the best of what is called "luck." On the contrary, I have seen many instances of cheese-makers, who had acquired an excellent reputation make a failure in changing locality. Everything appeared right on the surface, but somehow there was something in the milk or in the conditions and surroundings which escaped their observation, and caused unsatisfactory results. Much more difficult would it be for such a cheese-maker to achieve success should he enter a new factory every day, with different conditions and surroundings, and with different apparatus and arrangements for working. It would greatly add to his embarrassment if he had to overcome the

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manifest blunders of somebody else, or to cope with the wilful neglect or ignorant acts of others on leaving his work uncompleted, trusting to their faithfulness to carry out his directions.

Milk is a very complex and delicate compound, and is often very deceitful in appearance. It may contain the fatal germ of many diseases, or be full of subtle ferment, and not show it to any of the senses or usual tests. The trouble may develop itself soon after heating the milk, or it may not appear until the cheese has stood some days on the shelf in the curing-room. Again, milk may both smell and taste badly, and yet the cheese made from it turn out quite fairly. In short, we are so far in the dark as to the real character of milk and the operations of the dairy, that experts and scientists are daily confounded with the results of their experiments.

Knowing these things, I did not start out on my mission, in your state, last summer, with any idea of producing a revolution, or of achieving any wonderful results. Indeed, in the beginning, I had no definite idea of what was really expected of me. I at first supposed butter-making, as well as cheese-making, would be included among my duties. I did not know whether I was to stop at a factory, and completely overhaul it, staying until I got everything right, this to serve as a sort of school, or to merely give verbal instruction, here and there, leaving everything to the operatives of the factory. On reaching my field of labors, a sort of compromise between two courses was thought advisable.

I was to lecture to boards of trade and to dairymen wherever I could get a number together, while visiting as many factories as possible, supervising the operations of cheese-making, pointing out the main defects, and indicating the true method as far as possible. My work at the factory had to be done in a single day, or so much of the day as could be used and permit me to reach the next factory. It must be done in a single operation. I had to take everything as I found it without time or authority to change anything, save so far as it could be immediately modified with the consent of the cheese-maker or proprietor. If there was bad milk, I

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had to accept it as it was in the vat. If the rennet was bad, I had to use it—for I could get no other. I could not tell whether conductors, cans, strainers, vats, etc., had been properly cleaned, for they were already in use. Had they not been, unless dirt were visibly hanging to them, I could not tell what sort of water they had been washed in, nor how many ferments it contained. So I had to take the cheese-maker into my confidence, by telling him what results I wanted to produce, in the way of heating, the amount of rennet to be used, etc., leaving him to go his own way as far as I thought it safe. He understood the working of his heating apparatus; I did not. He knew how strong his rennet was; I did not. He knew the character of his milk, and how it worked; I did not. He understood his facilities for cooling curds; I did not. And so I might go on to the end of the chapter. I usually ascertained at what point he set his milk. If it was anywhere from 80° to 86°, I did not change it. I asked how soon his milk thickened after setting. If it was anywhere from 15 to 30 minutes, I did not change it; but always told him I preferred 20 minutes. Seldom, however, did coagulation begin in the time indicated by the cheese-maker. The time was almost always shorter or longer, as he was more or less correct at guessing. Hardly ever did he work by a time-piece. So in many cases was it with the temperature of setting. Almost always it was run above the degree named—sometimes going to 88° or 90°. Several times I found the setting below 80°, when something above was required. But these were minor points. I name them only to show how far many cheese-makers are from being exact in their methods. I shall have more to say on this point.

I was greatly surprised by two things—the smallness of your factories generally, and the primitiveness of their heating apparatus and other appliances. They were almost identical with what we used in the state of New York twelve to fifteen years ago. Nearly all had self-heaters, which are more economical for small factories; but they were not always of the most approved pattern. I was struck with the clumsiness—especially of those bricked

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up — though some of them did good work. In two or three instances, I was actually driven out of the factory by the smoke when the fire was started! In four counties, I found only two steam boilers and one curd mill. In the other counties visited, I found many of the same defects, but the apparatus was generally more modern and better.

I had a good deal of trouble in cooling curds. In some cases, the water gave out altogether, and in others the supply was so small or so hard to get as to make it very difficult to cool a curd, or to keep one that worked rapidly from spoiling. In a number of instances, curds were put to press too hot, because of the lack of facilities for cooling, and because the cheese-makers did not have the patience to wait. Most of the time, I had to leave before the curd was put to press. I would direct that it be left in the vat or sink until it had a distinct, clean acid, and was cooled down to 80°. In two cases, at least, the curd was going into the hoops hot and sweet before I had got fairly out of sight of the factory! This I accidentally learned afterwards. In five or six cases, the milk was sour or on the verge of souring, before I touched it; and in two of these, at least, the curd was put to press before being properly cooled, aired, and scoured.

In a majority of cases the rennet was a whey preparation — sour and tainted. Sometimes it was awful! It was like a thick soup made of carrion and vinegar! When the rennet was prepared in water it was generally more or less tainted, because sufficient salt was not used to make a brine. But what could I do? I simply told the cheese-maker his rennet was bad, and directed him how to prepare good rennet. Then we went through the motions of making cheese as it should be made, with directions for after treatment. Then I was off for the next factory, leaving the cheese-maker to carry out my directions, and knowing nothing under heaven could prevent the ruinous effects of the bad rennet. In one case I had from six o'clock in the morning until nine to work up what the discouraged cheese maker considered a hopeless batch of milk. He said he had not had a good batch of milk during the season. He had not a good cheese on the shelves of his curing-room. He was willing I should have my own

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way. At the close, as I was leaving, he said, "This is the first good curd I have had this season. I would rather have given $25 out of my own pocket than to have not had you come here." I left at nine o'clock, with directions to let that curd lie in the vat with occasional stirring, until two or three o'clock in the afternoon, when it should be unmistakably sour. Beyond this, I know nothing of the affair. It would very much interest me to learn the result. Indeed, it was but little that I had an opportunity to learn of the effects of my work anywhere. I heard complaints that the cheese made according to my directions was too soft. If it was, it was because not all my directions were followed, or because the cheese was put upon the market too soon. Besides, I find there is a difference of opinion among buyers as well as among consumers, as to the degress of softness. It is quite certain the "sweet whey" process does not make hard like the sour whey process. I will say more about this by and by.

The poor equipment of many of your factories is objectionable, but I do not know as it is avoidable. They are too small to pay expenses and the interest on the capital invested, and afford a profit. Half the number properly equipped, would pay better. In most cases it appeared that lack of capital, as well as lack of disposition to invest it, was at the bottom of the poor equipment of the factory. To complain of the lack of facilities was to complain of the proprietor's poverty— a most ungracious proceeding surely. A great evil arising from this state of affairs is the difficulty of training and controlling the patrons. Factories are too small and weak to offend their patrons by complaints, and the factories are so thick that the patron is not much inconvenienced in the delivery of milk by changing from one factory to another. This leaves the factories at the mercy of careless, selfish, and short-sighted patrons, and the man who is at the mercy of everybody stands a pretty poor chance.

I have read remarks about my having my reputation at stake, coupled with suggestions as to what I had better have done. Ladies and gentlemen, that is a matter that never

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entered my head. I always leave my reputation to take care of itself, and it does not give me the least worry. My aim is to do my duty in the best light I have. I aim to do the best I can under the circumstances, and always expect to abide the result. I was actuated by no different motives last summer when working among your cheese factories. How I worked and what I taught, I now propose to tell you. You will be the judges as to how wisely and well I performed my duty.

Starting with a vat full of milk I said, here we have a compound fluid composed of about 87 parts of water and 13 parts of solids. The solids are composed of about 3¼ parts of casein, 3¼ parts of fat, 5 parts of sugar, about .75 of one part of mineral matter or ash, and the balance is albumen and other matter, or what the German's call *ziega*. Our aim is to separate as much of the solids as we can and save them in the form of curd. The sugar is in perfect solution. I assumed it, for illustrative purposes, to be 5 parts. It is generally less, though it may be more, ranging from 3 to 5½ parts. A fair average is probably about 4½ parts. But as I allowed a large amount of solids — 13 instead of 12 or 12½ parts — no wrong was done nor principle violated in calling the sugar 5 parts, which is a large but not extreme amount. This sugar is what makes the acid in cheese, and we want to get rid of as much of it as we can. We must dispose of about 83 of the 87 parts of water. In getting rid of this, if we draw the whey sweet, we shall dispose of at least 4 or 4½ parts of the sugar, which will run off in the whey because held by it in perfect solution. We want to retain all of the caseine and as much of the ash as possible. We can not retain all of the ash, which is mostly in the form of phosphates, for some of it will go off with the whey. But we can retain, say 60 of the 75 parts in the milk. This gives us a remainder of, say 3.20 parts of caseine, 3.20 parts fat, .50 parts sugar, .60 parts ash, 3.50 parts water; total, 11 parts.

These figures are not scientifically correct, but they are a close approximation to correctness, and near enough for illustrative purposes. I have allowed for a loss of a fraction of the caseine, a fraction of the fat, a fraction of the ash, all

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of the *ziega*, which includes the albumen and any caseous matter not coagulable by rennet. So we have in our curd 11 of the 100 parts, but 3.50 parts are water. In curing we shall lose from .30 to .50 part of the water. This will give us 9.80 to 10 pounds of cured cheese, composed of 3.20 parts of caseine, 3.20 parts of fat, 3 to 3.20 parts of water, and also the ash and sugar; or, in other words, our cured cheese will be ⅓ casine, ⅓ fat, and ⅓ water. Owing to our imperfect methods of handling, we will assume that the extra waste is equal to the weight of the ash and sugar retained. We thus have an average result.

Now, to accomplish all this, what do we do? We apply heat to our milk, stirring it occasionally to keep the cream from separating, and raise it to 80° in very hot weather, 82° in hot weather, 84° in warm weather, and 86° in cool weather. Custom has fixed upon these temperatures without giving any reason for it. The best that I can give is that, if we set at a lower temperature, the curd works too slow and is too tender; if we set at a higher temperature, it works too fast and is likely to be too dry. But conditions may vary the result in either case.

What we call setting is adding the rennet and stirring it into the milk. If coloring is used, it is stirred into the milk before adding the rennet.

What is rennet? It is supposed to be the gastric juice or pepsin secreted by the stomach of the calf. The secretions of the stomach of the young of any milk eating animal will have a similar effect. The stomachs of these animals are saved in various ways. They are sometimes saved with all their contents in them, which is very objectionable. They ought to be emptied and cleansed of all adhering dirt or hairs, carefully rubbed with salt, stretched on a hoop or crotched stick, and dried. A good way for patrons is to feed the calf at night and give it nothing more, killing it the next day about noon. But it should be kept where it can get no hay, dirt or other matter to eat, and should be at least three days old. If a week old, the better, as the digestive functions would by that time be well established, and the stomach healthy. If the calf goes too long without eating, the

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stomach gets inflamed and discolored, and is not fit for cheese-making. Butcher's rennets are often in this way. In saving the stomach, do not cut a piece of the adjoining stomach off on one end, nor a piece of the intestine on the other. If the calf is treated as I have indicated, the stomach will be free from all contents and well lined with gastric secretions for cheese-making. Bavarian rennets are tied at the ends and blown up for drying. The ends are often tainted, and should be carefully cut off and thrown away. Sometimes rennets are salted down, like meat. I have had what is called excellent "luck" with rennets saved in this way, though it is not generally recommended. Rennets should be kept in a cool dry place. Heat injures them, but freezing and thawing appears to do them good, probably by disintegrating the tissue of the rennet and setting the rennet globules free. Old rennets are not only stronger, if properly kept, than new ones, but make firmer curd. I much prefer old rennets. Care should be taken to keep the rennets in the summer. It is well to tie them up in paper bags.

If good rennet extract can be had at a reasonable price, I would recommend its use. Where men make a business of preparing rennet, they can do it more economically, more scientifically, and make it better than the average cheese-maker can. The latter is apt to not properly strain the preparation, leaving too much animal matter to go into the cheese and breed taints. But if one must make his own rennet preparation, let him select his rennets carefully, being sure that they are all sweet and sound. Soak them and rub them in a weak brine, made by adding one pound of dairy salt to twenty pounds of pure water. If the water is not pure, boil it, and let it settle and cool, skimming off any scum. When the strength is out of the rennets, carefully strain the liquid through a good strainer, set it away, and let it settle, drawing off the liquid. Skim it, if there is anything to skim off. Then add enough dairy salt to the liquid to make a saturated brine of it. To make sure, put in enough so that a little will remain undissolved on the bottom of the vessel. Cover or cork tight — the tighter the better — and set in a cool place, as you would meat, for use. The United States

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Dispensatory, authority with all druggists and physicians, says gastric juice will keep a long time when excluded from the air; but on exposure to the air it soon loses its characteristic digestive quality, and takes on a very offensive odor. The same is true of rennet, which is a preparation of gastric juice.

Never use whey for preparing rennet. It not only contains albuminous matter that readily taints, but also most of the sugar of the milk, which turns to acid and is so much detriment to cheese-making, the acid neutralizing the rennet to the extent that it is present. But when a weak brine is used for soaking rennets, do not forget to make a saturated brine of the preparation, nor to keep it in a cool place. All the trouble, when water is used, has come from impurities in the water, from not using salt enough, or from not keeping the preparation at a low enough temperature. Sometimes all these causes are combined.

But let us now return to the process of cheese-making. We add enough rennet extract or rennet preparation to cause coagulation to begin in about twenty minutes, We must learn by experience, if we have no other guide, how much rennet preparation is required to do this.

At the end of ten or fifteen minutes more, or thirty to thirty-five minutes after setting, and as soon as the curd will break clean across the finger when inserted and lifted gently upward, we begin the cutting. But I should have said that, up to the time of the beginning of coagulation, the milk is gently stirred to keep the cream from rising and forming a cream curd on the top, or standing in drops of oil on the surface of the whey, as it sometimes will in a cold make-room.

The cutting may be done with a perpendicular knife, or with this and a horizontal one. But I had about as lief have only the perpendicular knife, as I do not find the advantage in the use of the horizontal knife that I once pictured in theory. I consider it a useless expenditure of money. If the curd would lie still, it would work nicely. But it will not, and I find the perpendicular knife, properly used, does all the work quite satisfactorily.

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Why do we cut the curd? Simply to facilitate the separation of the whey. This being the case, I am in favor of continuing the cutting, when once begun, until it is completed. If it is fit to cut at all, it is fit for the final cutting. I cut fine because this facilitates the separation of the whey more than cutting coarse. The whey has less distance to pass through in escaping from the center of a small piece of curd than escaping from the center of a large piece. I am in favor of cutting early, because the whey escapes more readily before the curd gets more contracted and tough on the surfaces of the pieces. As an Irish cheese-maker in Sheboygan county remarked, "It bleeds better when young!"

I have heard much talk about starting white whey by cutting whey too early. I have never seen a case of this kind. Last summer I often cut curds when the wise ones shook their heads. But they had to acknowledge that no white whey followed. There is more danger of starting white whey by rough handling of the curd, when tender, than in running a knife through it. If I think it is too soft to bear stirring, I wait a few minutes after cutting before starting the heat. I first rub down the side of the vat, to remove all adhering curd. If you do not, this adhering curd will cook onto the vat and get too much heat; but I never stir before starting the heat. I avoid stirring as much as possible in the beginning. When I begin, I stir gently—just enough to keep the heat equalized. This is all that is required; but this is required emphatically. Never stop stirring until the heat stops rising We want every piece of curd in the vat warmed alike. We want the center of each piece just as warm as the outside. As curd is a bad conductor of heat, this condition can be secured only by slowly and steadily raising the heat. I want it to go up only about one degree in five minutes. I heard a man say at the Western Ontario Dairymen's convention, recently, that he raised the temperature one degree in two minutes. This is too fast. Some stop awhile at ninety degrees. If one is raising the temperature as rapidly as this, it is well to stop at ninety, and several other points, to let the tempera-

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ture equalize; but if we go up a degree in about five minutes, we can keep an even temperature all through without stopping until we reach blood-heat, or ninety-eight degrees. The effect of heating too rapidly is to "cook" the outside of the larger pieces of curd faster than the inside. This contracts the surfaces and confines the whey in the center, thus hindering its escape. It would be preferable, if possible, to heat the insides of the pieces the faster, driving the whey to the surfaces; we do not want to do either. We want an even heat.

We talk of "cooking" the curd. But this is a misnomer. There is no cooking at blood-heat. Milk does not cook in the cow's udder, nor does food cook in the stomach. Yet both are at blood-heat. It is not heat that condenses the curd. Temperature is only a condition. The rennet is what does the work. We apply heat to facilitate the action of the rennet, which is most active at blood-heat or the point of digestion. A comparatively large amount of rennet, at a low temperature, will not work as fast as a smaller amount at a high temperature. But two curds worked in this way, and then both put to cure at the same temperature, the one having the larger amount of rennet will cure the faster. Here is a hint for makers of spring cheese, which must soon go to market: Use a fifth or a quarter more rennet, and work it at a low temperature. You can make it curd faster or slower by varying the temperature of your curing room.

When your curd has reached ninety-eight degrees, it should not go much over one hundred degrees, as a higher temperature weakens instead of strengthens the action of the rennet — you may stop stirring if the temperature has ceased rising. It is better to keep the temperature at ninety-eight degrees until your curd is sufficiently "cooked," or the curd is sufficiently freed from whey and has become firm. This, most cheese-makers recognize by the elasticity of the curd. Take a handful and squeeze the whey out. If it is firm enough, on opening your hand, it will at once rattle to pieces. It should do this some time before there is any appearance of acid. By cutting early and cutting fine, we gain time and get ahead of the acid. Some object to

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cutting fine for fear of waste. It is hardly possible to cut fine enough to entail waste. Harsh handling of the tender curd, tearing and breaking it, may detach fine particles that will float off in the whey — provided you do not give these fine particles time to settle down and adhere to the mass of the curd.

At Mr. Calkins' factory, near Palmyra, last summer, I saw Prof. Harvy cut a curd finer than I think I ever saw one cut before. When the whey was drawn off, it was carefully run through a cloth strainer by Mr. Calkins. The strainer did not catch half an ounce of fine curd.

After the heat is stopped at 98°, only occasional stirring is required to keep the curd from packing. If the make-room is cool, it is well to then cover the vat, as it is also after setting, when coagulation begins. A cloth, with strips of lath as long as the vat is wide, tacked to it, is convenient for this purpose. It is easily rolled up and put away, and as easily unrolled when needed.

It is well, when the heat becomes stationary, to draw off a portion of the whey, leaving just enough to freely float the curd. This leaves a less amount to draw off when desired, and guards some what against a point of danger when the acid comes on rapidly — especially where the loose curd system is practiced, as it is in most of your factories. The only objection to thus reducing the amount of whey is that, in a cool room, a smaller body loses heat faster, and a loss of temperature prolongs the operation in the vat. One has to be continually guarding against such drawbacks.

I now come to one of the mooted points — the final drawing of the whey.

Why do we draw the whey sweet? Because, if we let the acid develop while the curd is in the whey, we destroy the phosphates, which are essential to nutrition as well as to digestion. These phosphates are formed by the union of phosphoric acid with lime, iron, magnesium, etc. The principal of these phosphates are the three named — lime, iron, and magnesium. The lime is essential to the bony structure, iron and magnesium to the blood, and the phosphorus to the nervous system — there is also phosphorus in the bones.

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These minerals, when combined with phosphoric acid, are in exactly the right condition to aid in digestion and nourish the human system. We cannot live without them.

Now, when we develop the lactic acid in the whey, this acid has a stronger affinity for the lime, iron, and magnesium than the phosphoric acid has. Consequently they let go of the phosphoric acid and unite with the lactic acid, thus forming lactates, which are indigestible, or nearly so. Their union with the phosphoric acid once broken, this acid isl eft free in the curd, so far as it is not washed out by the whey — and all authorities agree that free phosphoric acid is very deleterious to the human stomach. So you see a double catastrophe follows if we develop the acid while the curd is in the whey; it deprives us of the phosphates while substituting lactates in their place, and it gives us food with free phosphoric acid in it.

Prof. L. B. Arnold and Dr. Francis E. Engelhardt, by a long series of patient experiments, made at their own expense and without hope of reward, found that cheese became indigestible in pepsin precisely in accordance with the amount of acid in it. Prof. Arnold has suspected this, and hence the experiments. He had previously reasoned the matter out and been governed in his cheese-making accordingly.

By general reasoning and subsequent investigations, he ascertained the fact that lactic acid converted the phosphate into lactates, setting the phosphoric acid free, and hence the indigestibility of acid cheese. Furthermore, the acid cuts the finer fats in the milk and causes a loss of these, thereby impoverishing the cheese and injuring its flavor to the extent of the loss. And when we have robbed the cheese of its phosphates and its finer oils, we have a pretty indigestible mass of curd. It will undoubtedly be hard enough and firm enough to ship, but it is not fit for human food. This kind of firmness, which some cheese-buyers admire, can never be had with a sweet whey curd — for both the phosphates and the finer fats retained tend to make the cheese softer. Hence the popular prejudice in favor of soft cheese for home consumption has a scientific basis. It originates

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in a healthy, natural instinct and appetite, and well would it have been for us if we had heeded it and never for a moment thought of making hard cheese for shipping. As Prof. Arnold says, in his book on "American Dairying": "Under the present state of things a cheese that will stand a voyage of 4,000 miles can hardly be called a fancy cheese. * * * But a much fancier cheese than we are now producing, one that will stand shipping, can be made. To do this will require milk to be free from some of the imperfections which are now quite common; it must be transported to the factories in better ventilated cans; it must be made with less rennet and less acidity; and it must be cured in an even and lower temperature." I shall have more to say under this head of lower temperatures for curing when I come to curing-rooms.

Now I wish to say right here that the sweet whey system originated with Prof. Arnold, as I have indicated, and nobody else. It is sometimes attributed to some one in Canada. But no one *openly* disputes his claim in Ontario. I have attended two conventions there, and in both this subject came more or less prominently before the audience, and no one laid any claim to it or disputed Prof. Arnold's title. Besides, we have the signatures of fifty or sixty cheese-makers to the fact that he first taught it to them, and the signature of Mr. Ballantyne, who is sometimes credited with it, to the fact that Prof. Arnold first introduced it in Canada and taught it to Ballantyne's cheese-maker. I say this out of no extra love or regard for Prof. Arnold, though I have great respect for him, both as a man and as a scientific investigator, but as a matter of justice and truth. I hate lying and thieving, and I consider the attempt of a few small-minded pretenders to rob Prof. Arnold of the credit due to him as outrageous and despicable. If the "sweet curd" or "sweet whey" method is to be designated by anybody's name, it is not that of Ballantyne, nor Harris, nor Curtis, but that of Arnold. It is *the Arnold method.* None of the others have the ability to solve such a scientific problem. But Prof. Arnold has one failing common to us all—he does not always make himself understood.

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It is much easier to follow the Arnold method where cheddaring and grinding curds are practiced than it is where the curds are worked loose. When you cheddar you can draw the whey almost any time; pack the curd along the side of the vat, after tipping it up; cover the vat with a cloth, and let the curd lie and ferment almost as long as you please. You have got rid of so much of the sugar with the whey that you are in no danger from the acid, about so much of which you have got to have at some time, and you can let the rennet work and the whey exude until the curd is as dry as you want it.

But when you keep your curd loose, the task is harder and much more difficult. You have great trouble in keeping up the temperature after the whey is drawn, and at the same time stirring your curd sufficiently to keep it from packing.

This problem at first staggered me, when I began to move among your cheese factories, almost every one of which that I visited working loose curds. So I hit upon the plan of drawing down the whey soon after the temperature reached 98°, to just enough to cover and float the curd conveniently. Then I let it stand about as long as I dared to, for fear of the acid, before drawing off the balance of the whey. But unless the temperature was lowered, it was almost impossible to stir the curd enough to keep it loose. So I lowered the temperature to 92° or 90°, and then parted with the whey. Still there was great trouble and hard work to prevent the curd from packing. Hence, as soon as the curd was dry enough, I sprinkled on the salt and stirred it in. You all know salt helps wonderfully in keeping a curd loose. I found that, at 90 or 92°, it did not require very frequent stirring to keep the curd in a fit condition to put to press. But here I met one great difficulty. Few cheese makers wanted to wait for the acid to develop after the curd was salted. It seemed to them a waste of time. I also found that almost every one had the impression that salt checked, if it did not prevent, the development of acid. No one had ever saved a sour curd by salting it; and no one ever discovered that the curd did not continue to sour and leak after it was put

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into the curing room. But I had to meet and remove this prejudice in neary every factory that I entered.

I do not think the salt in any way checks the development of acid; but the lowering of temperature probably does. Still it is, in the absence of proof, an open question whether exposure of the curd to the air, by the removal of the whey, does not facilitate the development of acid as much as lowering the temperature checks it. But I place no stress on salting the curd before acidifying it. It was resorted to as an expedient to save work. With cheddaring and grinding, I should never think of salting the curd before it is fit for the press. I would prefer to keep up the temperature, instead of lowering it to 90° to wait for the acid; but I see no way that a curd can be kept at 98° and kept loose without subsequent lowering of the temperature and salting, unless we leave it to sour in the whey — a very dangerous practice, to say the least, if we look to quality. The latter will give hardness, but it is at the sacrifice of valuable and essential qualities.

The best we can do is to wait until the first signs of acid and then draw the whey, unless we have some means of stirring and keeping the curd warm, as in the wire vat. But with a loose curd I prefer salting and piling it in the vat or sink, until the acid is well developed, instead of taking risks in the whey. I find it can be kept near 90°, in ordinary weather, by piling, and until the fermentation is beyond all danger. In one instance, at the factory of Mr. Calkins, near Palmyra, we held the curd in this way until it was full of pin-holes. We attributed the pin-holes to some taint in the milk, but Prof. Arnold tells me that any curd held in this way will show pin-holes. When it reaches this point it is beyond all danger from too rapid fermentation in the curing-room, at any reasonable temperature. Pressing takes out all signs of pin-holes, and they will never appear again. The cause of them is such rapid fermentation that the gases can not escape as fast as generated, and so they expand the curd as yeast expands dough in bread-making. I think this fact of carrying fermentation in the vat, or sink, to the point of forming pin-

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holes in a perfectly sweet and sound curd, will be new to most cheese-makers. It was new to me.

I did not at first put so much stress on the full development of the acid before putting the curd to press. In view of your universally imperfect curing rooms, if I made any mistake last summer among your cheese factories, it was not sufficiently emphasizing the importance of the full development of the acid before pressing the curd. I will refer to this when I speak of curing-rooms.

My directions were to wait until the curd was a clean sour, or distinctly acid, and was cooled down to 80° before putting to press. I also gave this caution — that, if the cheese was really too soft, they must hold the curd a little longer in the whey, if necessary, but be sure to sour and air the curd more before putting it to press, and especially to keep up the temperature while souring. This would expel more of the whey, and it is unquestionably a fact that cheese must be made considerable drier, in order to secure shipping firmness, if we retain in it the valuable ingredients of fine fats and phosphates. By removing these, we can make a cheese hard enough to suit the most stupid buyer. But, with proper curing-rooms, we can retain all the fats and phosphates that can be retained, and still make a cheese firm enough to ship, if given a reasonable length of time to cure in. One of the evils of the cheese business is the rage of shipping cheese almost as soon as it is out of the hoops.

It is hard to determine which is of the greater importance, good rennet or properly constructed curing-rooms; for both are necessary to the production of the best cheese, while the want of either is sure to injure, if not to spoil it. The importance of controling the temperature in curing has not yet taken hold of the popular mind. The best milk in the world may be spoiled by bad rennet, and the best curd in the world may be spoiled by a bad curing-room. In a large majority of the curing-rooms of the country the temperature ranges from 60° Fahrenheit to 90°, and even above. Sometimes these extremes are realized within a few days. Think of setting a curd to fermenting at 80° to 90°, when it ought to start at 60° to 65°! Yet this is fre-

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quently done; and to prevent the cheese from huffing and crawling, it is proposed by some to make the curd so dry and sour in the beginning that heat will not soften it. In this way is made what some buyers style a "firm" cheese. The best English cheddars, according to the American Encyclopedia, are set to curing at a temperature of 60°, and are never allowed to go above 70°. My observation and experience are that the range of temperature should never go above 75° Curing should begin as low as 65°, and no cheese should be marketed under thirty days from the hoops. When the curing is slow, as it ought to be, the cheese will not be ripe in less than that time. If sixty days old before ready for market, the better. The hurrying process is everywhere bad for the product, and no amount of souring helps the matter, however hard it may make the cheese, and however well it may stand up in hot weather. We want something else besides a standing-up quality. With low and even temperature for curing, we do not need to work all the goodness out of the curd to make a firm cheese. We do not have to cut the fats and phosphates out with acid, nor to dry all the moisture out by fine cutting, and high scalding, or long scalding. We can stop the cooking when the curd is evenly cooked through, so as to be springy when pressed together by the hands, take it out of the whey before the acid develops, and put it to press without unnecessary delay.

Last fall I ate some cheese at Mr. N. L. Brown's, Gurnee, Ills., which was dipped sweeter and put to press softer than I ever thought of doing; yet the cheese was close-grained and fine flavored, and would pass muster as a first-class cheese anywhere. But it was not cured in a hot curing-room, nor in one where the temperature went up and down the same as it was on the outside of the building. It was placed in his cellar, at a temperature of 64°, and there remained until it was fit to cut. Nor was it even rubbed, but only occasionally turned over. When cut, it was covered with mold and mites, and looked like a cheese that had been kept in a box a year. The superfluous moisture was dried out, but the butter and mineral phosphates were all left. It

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demonstrated what can be done by temperature. Had this cheese been cured in an ordinary curing-room, it would have gone all out of shape in a few days — as soon as rapid fermentation set in — and be off flavor by the time it was ten days old. Several other cheeses were cured in the same cellar, in the same way, though none of them were put to press so soft and sweet, but all sweet-curd cheeses, and all buttery and fine. This particular one was the result of hurry, as other matters than the curd demanded attention. But the thought came that it would make a good experiment, as it did, and the result was satisfactory, though not different from what was expected.

Cheeses made in the same way as the others that were cured in the cellar, and some cooked more and soured more, were made by the same gentleman, and cured in an ordinary curing-room. In hot weather they swelled, and some of them got out of shape, while the flavor was sharp and rough. But those in the cellar at 64° never apparently moved a hair's breadth out of shape, were as solid as old butter, yet enough for shipping even, and of the finest flavor. It is hardly necessary to say that the cellar was exceedingly clean and sweet, and was well ventilated. These cheeses were to me a demonstration if not a revelation.

It should be remarked, by the way, that a curing-room does not want to be a drying-room. We do not want to dry cheese; we want to cure it, that is, let it go through the proper chemical change. This it does best in a somewhat moist room, in which the surface does not dry and become hard and impervious, so that the gases can not escape. It is better to contend with a little mold than with a dry atmosphere, that will make a rind as thick and tough as sole leather.

I see, on turning to Prof. Arnold's "American Dairying," that he says: "The temperature of a curing-room for whole milk should be 65° to 70°; for part skims, 70° to 75°; for hard skims and sour cheese, 75° to 80°." It is thus seen that fat plays an important part in curing. "The more fat," he says, "the cooler may be the room, and the less fat, the warmer may it be."

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I insist that we can not do ourselves credit nor realize the best financial results in cheese-making until we build better curing-rooms — rooms in which we can control the temperature without fail. We have not yet settled down to cheese-making. We are still trying experiments and resorting to temporary expedients. We must build far more deliberately and for permanency. It is not necessary that I should point out just how a building may be erected so as to give control of the inside temperature. Architects know how to do it. When our cheese-makers get to the point where they demand such buildings, they will get them without much trouble, and at a moderate expense. It is only necessary that they should have the "will." The "way" will speedily open.

And now a few words, for the benefit of patrons, about milk and its production. I do not enter any special complaint about the quality and condition of the milk that I saw at your factories last summer. It was probably a fair average. I know it is customary, when there is failure, for patrons to blame the cheese makers, and for the cheese makers to blame the patrons.

Under the old acid system of cheese-making, probably both cheese-maker and patrons have cause for complaint — but the complaint is not always reasonable, because it is so often made on both sides in ignorance of the conditions. But there is no denying that very foul milk is often delivered at the cheese factory. I have, myself, been nearly driven out of the factory by what is known as the "smell of the barn-yard," when a batch of milk was heated up, and that smell and flavor followed the cheese until it left the factory, and probably until it was consumed. Such milk is simply an outrageous imposition on the cheese maker and the public. First milkings and the milk of sick cows have been known to be delivered at the factory. This is criminal — or should be, if law can make it so. All farmers know better than to save such milk for human food.

I probably was asked ten times last summer, how I worked up sour and tainted milk, where I was once how I worked up good milk. I do not think a cheese-maker should

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be called upon to work up bad milk. It is not fit for human food. It is the business of the milk producer to deliver good milk in good condition. If he can not do this, he does not understand his business, and should get out of it as soon as possible. When, by accident, he finds bad milk on his hands, he should feed it to the hogs, if he has anything against them, or to the calves, if he is not afraid it will kill them.

It is impossible to make first-class cheese out of bad milk. Milk on the verge of souring, and milk having taints and odors derived from food eaten by the cow, may be made into passable cheese, and sell at the highest figure, but it is never gilt-edged. As to milk tainted by sickness of the cow, it is intolerable, and can never be converted into wholesome food. Nobody above a brute will eat such cheese, if he knows it. Healthy cows, fed on healthy food, will always produce wholesome milk. It only requires cleanliness, ordinary care, and a little common sense, to keep and deliver it in good condition. The cheese maker is bound to make good cheese out of such milk.

I do not object to a little what is called "age" in milk, but I do not want it sour or tainted. Milk with "age" works faster, coming right along without delay. Why it does this nobody has ever explained. Some suppose it is because the acid develops sooner; but milk in which the acid develops even more rapidly, does not make as good cheese. The acid theory does not explain it; nor does the oxydizing theory—for oxygen has nothing to do with the action of rennet; it merely develops flavor by acting on both the caseine and the fats. I have a theory of my own, which I announced in the *Farmer and Dairyman*, last summer. It is found that normal milk, has on an average, one-fifth as much rennet as we put into it ordinarily in making cheese. Sometimes this rennet is abundant enough to cause the milk to coagulate before there is the least sign of acid. Now, the amount that is commonly found in milk must be constantly operating toward coagulation. In consequence, when milk is old, it is so much nearer the point desired by the cheese-maker. So, when he adds the rennet preparation, all the results follow

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faster than they would if the milk had not stood for hours under the influence of the rennet which it naturally contains.

The fact that rennet is a constant element in wholesome milk is of recent discovery. I think credit for the discovery is due to some German investigator; but I got the fact from Prof. Arnold, who, by the way, was the first man in America, if not in the world, to disclose the active agent of rennet. A German made the discovery about the same time, and Arnold thinks the German is entitled to credit for priority of discovery. But it was original with Arnold. He filtered rennet preparation through a piece of charcoal, and took all of the coagulative principle out of it. The fluid had no more effect on milk than so much water. Putting under the microscope what was retained by the charcoal, he found it consisted of minute globules, very much resembling the cream globules in milk. This he announced in a paper read before the American Dairymen's Association at Utica, in January, 1869.

In raising cream, the rennet globules go with the cream. This is probably why skim-milk requires more rennet in cheese-making than whole-milk does. It is also the reason why cream is so easily digested — and do not be surprised if it should be discovered that the rennet, naturally in cream, is an important factor in churning.

Ladies and gentlemen, I must beg your pardon for detaining you so long. But I could not well condense into less space what I had to say to you, and make myself clear. I could say more, and meant to have said some things which I have intentionally omitted for the purpose of shortening my paper. I have tried to be truthful and just. If I have erred, the error is not intentional. I aim to simply do my duty. If I thought cheese-making and helping dairymen to get a little more money was all there is of it, I do not think I would be here. In my judgment, there is a higher and holier meaning in all this. By consideration of these worldly subjects, we get mental discipline and development. If we work conscientiously, and deal justly with every one, we get moral and spiritual development. This aids us in our upward march of progress, which I believe is to become

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more and more glorious, and is without end. By our labors in this life, we are building the ladder by which we descend to lower depths, or by which we rise to eternal light.

DISCUSSION.

Stephen Favill in the chair.

Mr. Clark — Mr. Curtis has traveled quite extensively through the state. Will he state what distance they usually bring the milk to the factories?

Mr. Curtis — Well, sir, it has been decided by pretty good authority, that is, the dairymen themselves, in the state of New York, that it does not pay to carry the milk over *two and a half miles* to the cheese factory. That gives the factory a radius of five miles, two and a half miles each way. Beyond that it is thought to be too expensive.

Question — Is it any injury to the milk?

Answer — Oh, no; the milk can be put in condition to be carried a long way, by being properly cooled beforehand. You know on the railroads they carry it hundreds of miles, and still deliver it in good condition.

Mr. Austin — Have you ever made an estimate of the loss to the dairy interest from bad milk being delivered to the factory?

Answer—No; but it is very great; I should say it was one-fifth or even one-fourth, because it reduces the yield as well as the quality.

Question—Did you find any other parties than this one you speak of that cured their cheese in the cellar?

Answer—No, sir; and he didn't make a practice of curing in that way; there were some dozen or so that he put in for an experiment.

Question—Let me ask you as to the effect your instructions had with the average cheese-makers?

Answer—I think the average cheese-makers went right along just the same after I visited them as they did before, but they were men who demonstrated they were pretty good business men and made a success afterwards.

Question—In what way was this milk gathered?

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Answer—In my state the patrons deliver it themselves. In this state, I think the man has a route and goes his round. There is apt to be an advantage in that, too.

Question — I found myself, as winter was coming on, with about forty or fifty boxes of cheese stored in the cellar one year, and I was very happily surprised in the spring to find it the finest cheese I ever sold.

Mr. Curtis — I perhaps ought to mention one point. Buyers last summer requested me everywhere to speak about the subject of coloring, they said there was a limited demand for white cheese. The Liverpool market demands a small amount of white cheese, but they don't want any pale cheese or any excessively high colored cheese.

We found that one of the troubles was, that a number of factories would make up their different lots of cheese and there would be all colors. I suggested that they have a standard color and all use one kind, so that it will come out, not a pale or a high colored cheese, but medium straw color, that is what the buyers want in the market.

Mr. Favill — I have had some experience in cheese-making, and some years ago, I hardly knew of a factory that was properly arranged for curing cheese, and it is a matter of the highest importance; cheese made in the very best manner, may be totally ruined by the curing. If Mr. Curtis says Prof. Arnold is the first man that made sweet curd cheese, he is mistaken. I made sweet curd cheese and I found it would get all out of shape just because my curing room was not properly arranged. With the sweet curd we can make our cheese soft and by letting them cure right, they will keep their place anywhere. There is a great deal of difference between curing and drying. Make better curing rooms. We have many little factories that cannot afford to build a good curing room. You never want to get above 70° or possibly 60°, then you will get good cheese, but you cannot get good cheese in thirty days. It wants sixty days at least, and ninety days will be better.

Question — Mr. Curtis, I want to know what is the most prominent cause at the factory of bad milk?

Mr. Curtis — I think neglect in cleaning vessels, and han-

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dling, not properly cooling before starting to the factory; take it in the very hot weather, it is hard to keep milk good while you drive it two or three miles, with the cover on tight, in the sun. Of course, the feed of the cows has its effect. There are so many things I cannot go over them now. I want to say, Prof. Arnold never claimed to be the man that discovered sweet curd cheese; he was simply the man who investigated the matter and found out the cause, the reason why sweet curd cheese was better than sour curd.

Question — How would you put up a building for drying cheese so as to get the temperature as you want it?

Mr. Curtis — It would take some time for me to tell you, and any architect would understand how it could be done. The way would be to have two or three walls with air spaces between, make double walls, and double floors and double windows. If you get air space enough between the cheese and the outside temperature, you can keep it as you want it. One thing you can do — open your windows at night, when the air cools down, and let the air in, and then shut them early in the morning before the sun strikes in. I went into a cooling room last summer where the windows were open, top and bottom, and the sun streaming in there, and the fat was streaming too. I asked the man, "Why don't you shut these windows, except at night, keep the air out?" "Why, I don't know," he says, "but that is a good suggestion," and he was a gray-haired cheese-maker too.

HOW SHALL THE FARMER BETTER HIS CONDITION?

By C. H. COOK, Dover.

In the practice of medicine, physicians will tell you that when the nature of the disease is known, the prescription and mode of treatment thereafter becomes more simple. But as to the social, intellectual and other ailments of the farmer class of the state there is less diversity of opinion I

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make no doubt, than in the treatment and remedies proposed. My scheme is a good one, from my stand-point. My neighbor has one equally sound from his stand-point, and, so like all speculations in moral philosophy, when statements cannot be proved within the lines of arithmetical certainty, there will ever be found doctors to differ and dispute.

Dare we begin with the assumption that fewer blessings and comforts fall to the lot of the farmer than to those of the town and city? Some there are who think that the gifts of the gods, the favors of fortune, opportunities and all that, have long since been distributed with an even hand, and whatever of inequality there is, has come of our own doing. Are we all sharing alike to-day. In the lines of human advancement socially, financially, covering the whole ground, are we keeping even in the advance, or are we the stragglers of creation?

It is quite true, perhaps, that all men are made but of the same kind of stuff, and the kind of meat on which they feed makes them small or makes them great. Or if it be true that we have special grievances, what other conclusion else can there be than that the fault "is not in our stars, but in ourselves that we are underlings."

Also were it not for the fall, were not that curse first put upon labor, which singles out the sons of toil by their frock and tan from the rest of mankind, for some the farmer's life would then be more pleasant, the country would then be another Eden. Then might every hut and cottage fireside in our hills and valleys be all that fancy ever dreamed or canvas pictured. Do we ever feel as the shepherds of old felt while watching their flocks, that utter content with our lot? Is it not a little true that some of us whose lot or choice has placed us among the farmers, who may have read the pastoral poets to some purpose, have been taught by Corin, the shepherd in green pastures, to have no wish beyond seeing "our lambs suck and our ewes feed," and when the mood has served, found "sermons in stones, companions in trees and good in everything."

Is it not true I ask, for it has been your experience and mine, that close in the wake of such day dreams on some

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sudden recall, some jar like the plow point meeting a boulder, all these fine visions disappear, we are again following the harder lines of real life, and looking upon this picture and then upon that, does not one ask himself is poetry all a lie? Are all these pleasing pictures of the farmers, "such stuff as dreams alone are made of?"

Are all our conditions of life so favoring as have been painted from the time of Jacob and his herd to the present?

A young lady friend of mine once declared that nobody could be a Christian and be a farmer too. She had just been driving the steers out of the corn. Was that a natural expression under the circumstances or does the pious soul of Ruth patiently gleaning wheat in the fields of Boaz suit you better? The farmer's or shepherd's life was the chosen pursuit as it was the original one among the ancients. The descendants of Jacob drove their herds from one range to another unhindered by that modern obstruction, the wire fence and reservation lines.

From an occupation in its first stages came the inspiration of the first song, and to-day, there is no phase of life on which the muses of poetry and art so love to dwell; none more fruitful of themes, none which has given the world more pleasure to read, and the masterpieces of both the poet and artist take their inspiration from its traditions of the past and its customs of the present.

I am in sympathy in heart and soul with the farmer, and when I tell you that I have often wished I could love our calling as I love to read it, that the sunset glories which fancy has thrown around it could be more real, I don't deny it, nor wish impossible things for it; I simply wish that these fair sentiments, these higher aspirations of true men could find in us sympathy, that our "minds like the dyers were less of the color of the thing we work in," then might our daily lives bear better witness to the truth of all the best things written of us.

We ought to be content if we are not; we ought to be noble men and women if we are not. The best sentiments, the truest sympathies, the hearts and minds of the good and

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great of the world are on our side. This is a respect which we might better deserve if we would.

I am not one who looks upon the world outside as our enemies. There may be those who sneer and detract, to be sure, but let it pass. The best way to meet that spirit—and to conquer it, is first by bettering ourselves. The brain should be taught to labor as well as the brawn. It is no detriment to the muscle that the mind be educated, and the quicker that stupid sentiment is wiped out which looks upon all effort at self-improvement as smacking too much of the town, the better for all concerned. Yes, improvement in all ways is what we need, and not least of all in those ways which will enable us to make a little more money these hard times. It is said "that he can state a fact best who feels its truth most." Then he who has made money out of farming, is the man who should handle this topic best.

That many of us are poor in pocket is only too clear; and where is the blame? Some lay it to the railroads, some to the election, some to machinery and some to the protectionists. The latter opinion, at least, is palpably unjust; for, through the policy of protection is everything made cheap, so they say. Poverty then is and doubtless ever will be in the world among all classes and trades. But poverty below the point where ordinary comforts can be supplied, where health and a sound mind are given, is in a farmer, of all other men, the least excusable. Providence favors all alike in the fall of rains, the sunshine and dew in seed time and harvest, and sterile is that soil which under the hand of industry will not yield something more than a living. Whether it be the result of false education or other cause, a certain degree of prosperity begets a self respect and an attention, not so readily granted to men of limited means.

We sometimes, it is true, meet with men of a kind of mold superior to all rules and customs, who without a dime in their pocket have such resources of cheek or that degree of address that they can sort with their betters on equal terms on any ground. But with most men it is different. In order to that self-reliance, that unhesitating self-assertion which marks the master from the slave and stamps the

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creature a man, he must feel that he has a backing, such as only can come from ownership, from prosperity in some degree.

It is not necessary that he measure his possessions with a Dalrymple or some cattle king of the plains, and gauge his independence accordingly; let him own wholly and of himself alone that which he calls his, though it be but a few acres, a cow and a team and he feels himself a man. And only then can he or ought he to feel himself the equal of other men. Better to have little and be the sole owner thereof than to number your forties by the score and be under eternal tribute to the effete aristocracy of the east, to some retired mill owner of Massachusetts grown rich under protection.

We should not value too lightly the uses of money, or prosperity, if the word pleases you better, nor yet sacrifice our comfort from day to day in our devotion to its acquirement. But by all means get enough of it to pay your debts and to give you leisure in time of need to go to the polls and assert your rights as citizens. Besides supplying the comforts and leisure moments of thought and mental recreation it is wonderfully assertive and bracing to one's spinal column when opinions should be expressed.

Nor yet can we all be rich nor our farms of equal extent and fertility. Some of us must be poorer in worldly possessions, as some of us are richer in the grace of goodness than others. There is a doctrine abroad, and it receives the sanction of some of the best in our land, that man shall be measured by the amount of his wealth, by the extent of his acres, or the length of his rent roll. This is a pernicious doctrine, and rather than see it obtain currency or get a following in the customs and philosophy of our times, we would welcome again the Spartan simplicity of old, when poverty was a virtue and wealth a crime, when courage merited the highest reward, when weakness was branded a stigma and a shame.

Wealth, as a means for the convenience and comforts which it brings us, for its purchasing power in enabling us to secure health, education, self respect, and the respect of the world, is desirable and worthy, and should not be ig-

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nored. And little need, I am sure, there is in pointing this lesson. Already it has long been taught, less in theory than in practice, till it has become instinctive, ever present in the minds and motives of men.

But money as an idolatry is an abomination, not less unto the Lord, then unto all men of sense. Notwithstanding, its devotees continue to be numerous and doubtless ever will be, while the passions and appetites of men remain as they are. In spite of the simple democratic tastes of the fathers which found expression in the first Adams riding on horseback unattended and alone to his inauguration as President, we, as a nation to-day, are in hot haste for wealth.

From the country to the town, go the keenest energies and the sharpest minds, and for what? To make money. It is there they find the readiest exercise of the money making faculty, the largest and quickest returns. Is it an advantage or a disadvantage that the town beats us in the accumulation of wealth? Which ever it is we had better be content, for to rival them is not to make ourselves happier, and the advantage in situation can never be overcome. And if there be those who envy and sometimes make themselves miserable by such comparisons of unequal advantage, just remember that in spite of greater riches, many a carved and oaken door closes upon miseries which only wealth may know. Read in the weekly calendar of deaths, those whom the miseries of wealth have driven to wretched suicide. Let us be moderate and reasonable in our wants and industry and good habits will see them all supplied.

Do any of us know of farmers who would deny their calling if they could. I have known such. Men of accredited sense, who hold a high head in the world and consider themselves of consequence, that like to resent the name of farmer. For my part I may not be puffed up with my lot in life on account of the association or occupation. And even in them I believe I have as little to blush for as he of the town. And I am sure I would scorn equality with that individual who should consider the act as condescension to grasp in fellowship the hand of labor.

It is not to be disputed, perhaps, that the farmers of the

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land do not stand relatively on a footing with the commercial, professional and other classes in respect to that thing called society, or in political influence, equaling in numbers though they do all others combined. In a measure, to be sure, we are much to blame, but the odds, it must be allowed, are against us in the matter of advantage—advantage, such as closer association, mutual dependence in trade, daily and hourly competition in society and business. Then the secret and skill of all this lies in organization, which of all things else for the promotion of the general good there is no greater lack. But in this, too, we have signs of splendid improvement. In these associations and kindred conventions to which the farmers come flocking as to a feast, there is promise of better times. In these meetings for counsel and mutual encouragement, we all learn a better wisdom, a sounder sense. We get to learn something of business. We get general information. We grow united, which is strength. And all these taken together make social happiness, make better thrift, better men and lovelier women.

Organization among farmers — I mean in the narrower sense of communities as well — must grow largely out of a better acquaintance with newspapers, and a livelier interest for things beyond their own little horizon.

Organization and more intelligent business habits, as I have said, are the crying needs of Wisconsin farmers. This idea, to my mind, cannot be too forcibly expressed nor too often discussed. Better yet if it be preached for the next fifty years with as much regularity and frequency as was that old text of slavery times, "servants obey your masters."

In this new departure we shall, of course, have the traditions and notions of our grand old fathers against us — that is, some of us. They believed more in the virtue of old usages and customs, that each man should somehow rustle for himself, independent of societies and clubs. We shall have ignorance and prejudice to combat, in a diverse population, diverse not more in language and nativity than capacity and zeal. And here again education forms the necessary

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basis, the lever of Archimedes, in fact, on which all beside may rest.

How potent is organization. The newspapers have their union, the merchants their exchange, the railroads their pools, and the mechanics, that class nearest of kin to us in employment, learned the strength of association a hundred years ago. Is the farmer forever to loiter in the wake of civilization, the dull pupil who must stay to recite his lesson after the others are finished and gone? And here again we plead the old excuse that our homes are scattered widely apart among these hills and valleys.

To this end granges, clubs, alliances, and the like, are all good — better, in fact, for this sort of gain, than for which they were especially intended — commercial gain. Not selfishly by any means do we urge the idea of closer relations and unity of action, not for offensive operations, not in anticipation of enemies to be met and overcome by sheer force or weight of members, not to wrest from weaker classes that which is their own, but that we may better learn the equal rights of all, insist upon their fair division and peaceably maintain them. Organization, though it be the source of all monopolies, may be its antidote. "It is excellent to have a giant's strength" when it is under the dominion of a just mind, and stands as impire for right. Organization does not include the idea of reprisal and conquest. We know that there is no such thing as absolute independence, not even in speech or action.

The world is necessarily full of concessions and compromises. Every man to some extent infringes the rights of his neighbor, and this friction will always be where there is more than one man. Then, as two heads are better than one in solving any question of right, organization by all means should be our aim, that through it we can better help ourselves without jostling or hindering others. And not to unsay in any sense what I have already said, nor to sound a false alarm, it is good through which to compete with other classes. The world of politics at least is not so utterly innocent as Mark Twain when he traveled in the Orient, or not so wholly above suspicion like certain characters in his-

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tory as to make vigilance uncalled for or watchfulness a prying impertinence in marking the character of our laws and law-makers; and as detectives in this work, how much we need the discipline and tact. But in all these adjuncts we are growing, if our good and best historian, Hon. J. M. Smith, can be relied on in giving estimates, and he can be. As steel sharpens steel so wit sharpens wit. Comparison of experience makes us better farmers, social intercourse, self-reliance and friction of mind with mind, make us ready men. In some of these latter accomplishments in vieing with the town we may yet take a back seat, but if headway in chopping logic and sharing in readable discussions, count for anything in attainment or excellence as citizens or public servants, then can we not hope that in the sweet bye and bye, we may "get there." It may be a time, indeed, before the students of rhetoric copy our diction, or our elocution becomes the model of the schools, or scrap hunters filch our matter for choice quotations, or our manners become the envy of society. Bean Brummels but in the main business of life, in the matters of good breeding and good sense we may congratulate ourselves on fair progress, and all in spite of difficulties to others unknown. Our opportunities, not always the best, must be improved to the utmost, and while all that heart could wish for does not come as rapidly or in a measure as full as desired, remember that it is the constant dropping of water that wears away the granite.

Let us be more in sympathy with our neighbors. Leave off the bickerings and slights which make us enemies instead of friends. Dismiss from our minds those things which chaff and sour. Repeat to ourselves the words forgive and forget as the religious devotee does his ritual. We cannot hope for agreement in general matters with dissensions at home. It is said the French nation present the strange spectacle of strife and constant broils among themselves, which, on the approach of hostile foes without, changes to concord and unity of action. But we are not a French nation and we cannot rely on caprice to unite us in moments of sudden need, or permit ourselves to indulge in

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neighborhood strife on the chance hope of harmony when occasion demands.

I often wish it were even more of a truth that a little leaven leavens the whole lump; that a few such farmers as we all know in this state, might by their example of manhood and character, infuse the entire farming community with something of their tone and quality. But whisper it not in Gath. We have a motley crowd to deal with. All sorts and conditions. More mixed and confused than the tongues at the tower of Babel. Year after year our numbers are increased by a class, robust in health and sturdy honesty, who yet do not, nor cannot instantly adjust themselves to their new conditions.

In trade, politics, law and religion, there are certain precise regulations, rules and principles, to which all followers thereof must at once comply. The arriving merchant from Italy or Norway, adjusts himself to the American mode without friction and with promptitude and ease. In religion the minister takes up the sacred lesson where he left off in Vienna or Stockholm; the lawyer accustoms himself to his new relation without jar or discord, but the farmer brings with him his old ideas, surrounds himself with his old conditions, yielding nothing of his own notion but his citizenship, and thus entrenched, woe is he who invades that vicinity with the dainty notions of the new world ideas. And this is but one view of the nature of our task.

Erase from the hearthstone the slavish idea that all labor is for labor's self, that man is a man to the extent only of his capacity to perform the labor of a beast, that the uses of home are the same as the hovel, a place merely to shelter in from the storms, rather than the dwelling of comfort and refinement; a place to think, to dream, a place for books and papers, for painting and music, and not a retreat for animal ease and sensual pastime.

To keep pace with the rest of mankind we must improve. We must try to overcome in some way the disadvantage of location. We have no telegraphs to be sure, no telephones, no pavements for going and coming, no electric lights, nor music halls. Our nearest place of meeting is the school-

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house some miles away, the time always 7 P. M.; and our path, the highway through the mud or through the deeper snow. We meet without ceremony; we never see each other between times, because we live miles and miles apart. Are these trifles to be brushed aside and overcome? Let our brothers of the favored town answer. Yes, and the town, what is it? "Only the country come to town day before yesterday that is city and court to-day." And the same man has said that "the city would have died out, have rotted long ago, but that reinforcements were coming from the farms and fields." The city is the home of the cultured and refined, the home of scholars and poets, the resort of science and art. Dr. Johnson used to say that London was the world and the world was London.

But after all whatever of sturdy character or physical perfection, whatever of rosy health and practical life, for they are the energy and power to success, they came near or remotely from the country — a daily infusion of healthful life to energize and rebuild the decaying and crumbling power of the city. To be sure no credit is given; all the same, the current flows on to sweeten and renew, even as the fragrance from a bank of flowers floats through the shady window of the poet to help him at his task.

Then let us try and make of our business a success; for, of all successes, there is none more pleasing, more gratifying than the success of the true farmer. Away from the fever and excitements of trade; the country is the true nursery of youth, the home of man in his best estate; and to that end we must study something — anything beyond the daily treadmill round of life, anything to lighten labor of its exhaustion, to keep the mind of man from becoming like the clod, the man himself from becoming the mere animal of muscle. Then shall we have reached that ideal period described in the lines of Whittier:

"Then more and more we'll find the truth,
Of fact and fancy plighted,
Of culture's love, and labor's strength,
In these hill homes united."

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WHAT SHALL BE DONE TO PROMOTE BETTER DAIRY EDUCATION AMONG THE FARMERS.

By J. D. LEWIS, Arcadia, Wis.

I should infer that this association very probably thought they had made a strong point when they placed me on their list for a paper, devoted to the subject of, "What Shall be Done to Promote Better Dairy Education Among our Farmers?" and then very kindly added, as a sort of a tonic or general panacea, I should presume: "This subject is certainly one of great interest to every one who keeps a cow, and Mr. Lewis will no doubt be able to point out the right road to travel." Well, there is serious doubt of my being able to point out as clearly as the gentlemen have, it seems, anticipated. If it were practicable to point out this right road to secure a better dairy education in a very brief manner, I should at once say, run your agricultural colleges as a separate institution, and send your boys up to Prof. Henry for a term or two, and I would willingly guarantee that they would not only find the right road to travel, but come back very materially benefited in their general education of the dairy interests. In meetings of this character, we suppose the discussions, papers read, and questions asked and answered are all for the purpose of mutual benefit, not only for those immediately connected wiih this meeting, but the whole community that are now, or are about to become engaged in this vocation. The industries of butter and cheese-making have increased with such wondrous rapidity since the introduction of creameries and factories, have been of such real benefit in increasing the prosperity of the communities where they have been most extensively engaged in, not only in the increased value of farming lands, but in the real bettering of the condition of the people, who before this were raising grain exclusively, that it is, indeed, worthy of the most careful consideration of all classes, directly or indirectly engaged in the occupation of farming. As good, natural grasses and plenty of the right kind of water are

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the material requisites necessary to successful dairying or stock-growing generally, I propose to discuss in a brief manner, and for the first time, call the attention of the public to the peculiar quality of the soil in this section, and its adaptability for successful grass-growing, especially clover, and of its action, through the grasses and water, in producing a superior quality of butter. I believe by so doing I can in no better way answer this question or promote the general education of the dairy interests among cur farmers, in this locality at least. It is now, I believe, generally conceded by all stock-growers that there is no plant grown that requires so small an outlay of labor and expense generally, and furnishes so great an amount of plant food of just the right kind for producing the best butter, cheese, and good, quickly-fattened beef, as clover, where it can be grown with anything near success. It has been but a few years since the plant was first introduced in this section, and now it is not as extensively grown as it should be. Where there is now an acre there should be a hundred grown in this locality, for I am well satisfied that there is a section of country, including the most of this and Buffalo counties, and a portion of Minnesota, lying across the river, opposite Buffalo county, that can not be excelled for this purpose by any section in the United States.

My attention was first attracted to this subject some eight or ten years ago, by noticing spots along the roads where clover had sprung up in small patches, in soil either wild, or but, at the most, partially subdued. I observed that it grew in the most luxuriant manner, and spread rapidly, did not winter kill; in fact, looked just as if it had come to stay. I then began a thorough examination of the soil that I have not yet entirely completed, but have ascertained enough to warrant me in saying that, through the agency of the decomposition of an ancient stratum of rock, of which the most of our argillaceous clays are composed in this vicinity, I find we have a soil peculiarly adapted to the growth of clover.

As this is not in any sense a scientific meeting, I shall not attempt to describe, in technical terms, this peculiar chem-

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ical composition, but simply say that it is here, and, as I believe, in the greatest abundance, and is second to no other known mineral combination in the production of clover. What material benefit would it be to say to a community of farmers that gypsum, or what is best known as land plaster, is composed of 46.51 of sulphuric acid, 32.56 of lime, and 20.93 water, making an even 100? This kind of education they care but very little about. What they want to know is, is it beneficial for the production of certain kinds of crops? They prefer to test its efficiency by actual observations, as I have frequently done. When on the top of some of our highest bluffs, I have looked off a distance of several miles, or as far as one could distinguish color, and could plainly see where clover had been plastered, and where it had not, by the difference in the color. In all other localities that I have been acquainted with, it was necessary to resow land to clover every three or four years at the farthest, in order to grow it with any success. If they did not, it would run out entirely. And more, while we here would only sow about four to six quarts of seed to the acre, they are compelled to use from twelve to twenty, and often a bushel. As the seed is always costly, this of itself is quite an expense. Here I do not know if it would ever run out; its tendency is the other way, to run in. It is the worst thing to get out of a corn-field planted on clover and timothy sod, of anything I have had to contend with. Two years ago I plowed under eight acres of clover that had been cut continuously for five years, and it was better than the first year it was sown. My observations in this direction have satisfied me of another great fact in the butter-making line, that this chemical compound spoken of produces, through the agency of the grasses, a fine color and most delightful flavor to the butter, without which the best butter makers in the world will produce an inferior article, and as all living waters running through the soil must contain, to a certain extent, in their composition, more or less of the material of which such soil is composed, so we find here we have water that can not be surpassed in butter making. What were the reasons, do you suppose, why the Arcadia cream-

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ery butter took the first, and the Alma creamery the second premium at the fair held at St. Louis last fall? This was from butter made in Arcadia the second, and in Alma the first season of their operation. You could not believe, for a moment, that the butter makers employed in these two creameries were so much better than all the others that exhibited butter at that time, that this was the cause of obtaining the premiums. I find, also, that the Arcadia butter, when placed upon the Elgin market of Illinois, is considered superior to the other butter there, in all the qualities that go to make up a first-class article, and that is the largest butter market, outside of Chicago, in the state. You would most certainly assign this cause to other and more correct reasons, and, by an investigation into the facts, would find it was produced through the effects of this peculiar chemical material, in its action through the grasses and water of this region.

When a capitalist, or a combination of them, wish to engage in some manufacturing enterprise, they look out the most suitable locality for successful operations, figure out to a cent the cost of the plant as it is termed; calculate, with a reasonable certainty, that the present high protective tariff will continue in force through their lives, and those of all their relations, and then ascertain exactly the amount of dividends that will be received by them, generally, semi-annually, for the support of their over-worked wives and daughters at some fashionable watering place, or in their annual trips to Europe. If a great many dairymen would only partially follow the mechanical exactness of these other fellows, they would frequently come out better than they do. Their cows would be milked with more regularity. Their milk vessels would always be in good shape, and the general management of the whole business conducted in a manner that would always insure success.

It is true, you never can expect the dividends the other fellows are receiving, for they have the inside track, and are going to keep it. The average protection to them amounts to 46⅝ cents, while yours is four cents per pound on butter and cheese, and this dodge is so transparent that it would

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require the most powerful magnifying glass ever made to detect a particle of benefit you have ever derived from it. Your surplus butter and cheese is shipped out of the country, and, therefore, subject to no protection. But our eminent statesmen assure us, with the utmost gravity, and faces as long as your arm, in their intensity of feeling, that if it were not for this enormous sum of four cents a pound protection, that they have with so much wisdom placed upon butter and cheese, the country would be flooded with pauper butter from Europe. I apprehend that we have nothing to fear from this pauper butter spoken of. I think it will be found strong enough to take care of itself.

Any one looking on Prof. Owens' geological chart of his government survey of this state and Minnesota will see a small area, colored and marked metamorphic shades. It is no great extent of territory, includes this and Buffalo counties, and a portion of Jackson, and about as much in Minnesota. It has been badly cut up through the agencies of erosion, corrosion, and denudation, and probably one-fourth of this area is now composed of arenacious valleys. But I predict that the time will come, and at a not very remote period either, when from this small extent of territory there will be more butter manufactured in one year than is now in the whole state of Wisconsin. All that is necessary to do is to clean up the hills, break them up, and sow clover and timothy after the soil has been partially subdued. It is not going to dry out or run out; in fact you cannot drive it out. Then bring on your cows, and you have got a gold mine that the Pacific slope never equaled. Those placer diggings, however rich they might have been first, were soon worked out and exhausted; but this I believe to be practically inexhaustible. Now do not say I have not pointed out the right road to travel, but rather say I have made the way so plain that the wayfaring man, though entirely unacquainted with the business, need not err to any great extent therein.

Mr. Hoard — I would like to ask Mr. Lewis, what agencies what means shall we employ to get at the agricultural

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mind, to work upon it, stir it up, and thereby promote this very desirable dairy education among these farmers?

Mr. Favill — I just want to put the answer in your mouth for that. It will be to take *Hoard's Dairyman.*

Mr. Hoard — Mr. President, Mr. Favill will please hand over a dollar, for he is not a subscriber.

Mr. Favill — I live close by and get it by word of mouth. We will be very glad to hear you now, M. Lewis.

Mr. Lewis — To promote that interest with farmers in my estimation, the first thing that would be necessary would be to excite some interest, attract their attention, to show them that they can make more money out of it, than out of raising grain. That, of course, would be the first. Now then, if they can be convinced that they are in the right place to raise cattle — and cattle must have grass, and the right kind of grass — when they are brought to see that, it is another step, and it seems to me the farmers must at least think of trying it. My idea of what can be done to promote dairy education, is what has been done for a number of years. We have talked it over among our farmers, that farming was poor business and that we want something to replace the present method of farming, but we want to feel the dignity of labor, and that if a man is successful, there is no difference where he labors; that every successful man on the farm is entitled to the same respect that the successful man has in any other business. In fact, that you cannot bring too much intelligence to farming, and that there is no man on God's green earth that knows too much to do this work right. Tell a boy that there is more money in one Jersey cow than in any ten acres of land to till, and after you have convinced him of it, he will want a Jersey. Where is the boy who will plow and till ten acres of land when he can get the same amount of money out of one little cow? Teach a community that it is not disgraceful to milk a cow; We want to put dairy farming and stock raising all on the same great equality. And in this case we don't want to exclude the other side of the house. Let us treat our women, our girls as our equals; their interests are just the same as our interests. Our success should be theirs.

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OUR NECESSITIES.

Hon. A. A. ARNOLD, President State Agricultural Society, Galesville.

Maturity means ripeness. With mankind physically, in order to produce the best results as to hardihood and facility for endurance, the case is not different from that of the lower animals. Maturity with these should occur at proper ages, and with proper treatment in conformity with nature's laws. If proper food and protection from the elements are denied, it must be at the expense of vitality, and thus affect the progeny. The idea that exposure and neglect will make an animal more profitable and hardy is not true.

If circumstances are such as demand exposure and fatigue as in man or the working animal, habitude to extremes will for the time better fit them for the efforts which may be necessary to endure the trial when it comes, but when the exposure is so great as to be at the expense of vitality, the loss is greater than the benefits.

Statistics from the insane asylums show that insanity is more prevalent among those that have had to endure privations, those of bad and intemperate habits and those that have had bad and irregular diet.

It is climatic conditions and diet that have, during the ages, brought about the great diversity in the human race. The dwarfed Patagonian and Esquimaux are the result of great extremes of temperature, while the best physical and mental development of the human species are found within the temperate zones, thus proving that great extremes, while it may enable persons to endure by reason of habit, it does not tend to the more desirable development of the human race.

The same is true of the brute creation. Climatic conditions and treatment have developed the different breeds of stock, so that if we would raise as good or better stock than we have we must afford them the conditions necessary to this development, and it may be done more rapidly by the infusion of better blood.

If a man would raise good Jersey cows he must give them

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a good liberal diet, and plenty of shelter from the extremes of heat and cold; have them bring forth young at a reasonably early age, and milk them well up to within two months of calving.

No cow, or dairy of cows, no matter what may be the breed, will attain the maximum of profitableness unless all these details are complied with.

The cow Mary Anne would never have produced 36 lbs., 12½ oz. of butter in seven days unless she had been fitted for it for the four months preceding the trial. So we may not expect the best results unless we observe the proper treatment of the cows the whole year through.

A good physical development is as necessary to a Jersey in order to produce the best results, as in any other animal. It is preposterous to suppose that a little machine weighing 700 pounds will produce as much butter as the machine (like constituted) weighing 1000 pounds.

In reading the record of the cow Mary Anne, I noticed that she weighed 1000 pounds and over, a large cow for a full-blooded Jersey. She was fed during the trial as high as fifty quarts of meal per day composed of oats, peas, linseed and bran, in from five to seven rations, and at every meal partook with a relish.

I think this is about the amount of meal that a good farmer in Trempealeau county would give ten cows, and he would receive about the same amount of butter as from Mary Anne in the same number of days.

A farmer purchases a Shorthorn bull to grade up his stock in size and quality. The first thing he does, perhaps, is to try the Irishman's experiment to make an easy keeping horse — by gradual approaches he had got him down to one straw per day when he said the old fool up and died.

With a young bull, as with any other young animal destined for utility in after years, the treatment is the same, only more liberal as a necessary effort for their restlessness, and consequent waste of flesh and vitality. As well might a man who feeds his horse three quarts of oats per day when standing in the stable most of the time, and then expect him to do as well with the same feed on hard work, as to

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turn his bull loose in his herd, where he will be almost constantly on the race, and expect him to thrive as the other cattle with the same keep.

If a man wants a breed of cattle that will survive on the least feed he should never attempt to improve them by buying improved breeds of any kind. A mongrel of any kind will do for him. All the profit he gets from stock is to turn his coarse fodder into manure and a mongrel will do this as well as any other. Improved breeds have only been produced by careful selections, feed and treatment that have been continued until the desirable characteristics have become habitual and constitutional, and will, if properly handled, be transmitted to their offspring, even if bred on inferior stock. I have seen some half blooded Shorthorn steers that had all the characteristics of full blooded Shorthorns. A bull that shows this potency of blood in his offspring is cheap at almost any price.

Hunger, exposure and consequent unthrifty condition, show directly in the progeny, and the longer it is maintained the greater are its effects.

So on the contrary a thrifty habit becomes constitutional, and if maintained, will show in the progeny.

A man that begrudges the feed his stock eats had better turn his attention to some other business. Say let him keep bees, they steal most of their living.

Now early maturity with the cow means that she shall be well developed at two years of age, and then have a calf; then, if she is properly fed and has a calf once a year, she will not attain her full size until she is eight years old, when she will be at her best; after which, she will slowly decrease in her milk producing qualities.

With the horse destined for work, early maturity is not desirable, however much it is practical, in order to get rid of the three year olds for the same price as for a five year old.

I am aware that many horses sell now a-days for their beef, but these are not always the best horses, as every body knows. Horses are valuable for their speed and powers of endurance, and they should be reared with these prominent ideas in view. As before stated exposure and neglect does

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not produce this; on the contrary it induces disease and constitutional weakness; also, forcing is nearly if not quite as bad for the horse or breeding animal, for their future utility.

A too early maturity is not desirable in any breeding animal or in an animal destined for hard work.

With animals destined for the butcher, experience proves that early and quick maturity is not only profitable, but produces a kind of flesh most palatable, if butchered when ripe as it is called. Meat from an animal in low condition is not the best for food, nor is the meat from an over fed animal, healthy, for the over fed animal is liable to disease; indeed, all animals that have been pampered for a long time are not healthy, which is manifested by their loss of power to reproduce, the proper attendant with all healthy animals during the ages marked out by nature. This thought kept constantly in view by the farmer, will guide him, and he may not expect vigorous young things on his farm unless he feeds well, nor strong, healthy stock if he pampers and over feeds.

The profits derived from early maturity of animals destined, for the butcher, must depend much on the cost of food, and the markets. No invariable rule can be followed in this, any more than in any other, that the farmer has to deal with.

There is no occupation that demands so much of care and good judgment to insure the best results as in farming, and especially in stock raising; and if a farmer thinks to escape all care and have the money come in without persistent efforts he must not go into the stock business, unless perhaps he moves to the southwest, where stock care for themselves the most of the year; and even there they are constantly obliged to introduce new blood in order to keep up with the demands of the times.

This explains the reason why there is such a demand for all the improved beef-producing breeds of cattle, and all the young bulls find a ready market at paying prices.

The average price of Shorthorns that have been sold at the public sales for the last fourteen years is $262.32 per head; and for the year 1883 it was $205.50, thus showing

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that, notwithstanding the great supply of these cattle, the demand is as great as ever.

I found by consulting the 26th Vol. of the American Shorthorn herd-book, that there are over 2,200 breeders in the United States and Canada that have animals therein recorded. Doubtless each of those represent as many as ten head of pure-blooded Shorthorns, which would make 22,000 head, and no doubt there are as many more owned by men not reported as breeders that have purchased these for use in common herds, and thus we have a total of 44,000 head of these cattle in this country. Surely if there is any aristocracy in stock these are the champions, for they can show the best and longest pedigrees, and their works live after them.

Twenty years ago the average price of export cattle was about $38 per head. Now the average price of export cattle is $87 per head, showing the rapid increase in the quality of the cattle of this country produced by good feeding and the infusion of the Shorthorn blood, for until a recent date, no other beef-producing cattle has been imported into this country. All the cattle exported, except from the southwest, are grade Shorthorns. The average price for Boston last year was $90 odd, from New York $80 odd, while from New Orleans and Galveston it was $38 per head. Most of these grade Shorthorns shipped from Boston and New York are raised in the middle states right from the homes of the fine herds of Shorthorns that are constantly sending out their pedigreed bulls to be used in the herds of the farmers that are building up these beautiful steers, graded up many of them so that no one could detect them from the full blooded Shorthorns. They are beauties, and no one that has ever been in the Union Stock Yards at Chicago, could have failed to see the difference in quality and price of these as compared with the improved stock shipped in mostly from the northwest. A buyer with a car load of grade steers, whether fat or lean, can tell just what he can get for them in Chicago by the market reports, and if he wants them he will pay their full value when buying rather than not handle them.

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With scrub cattle it is different. He never knows what he will receive, for the quotations cannot show. In fact there are no quotations for our scrub cattle; they are not as good as the Texas cattle are now, for they are more or less graded of late.

This being the case, the buyer is cautions in buying, and unless on a wide margin he lets them alone, which in part explains the low price paid by our local buyers for scrub cattle of all kinds. Sometimes they strike a man in Chicago that wants that kind of stock, and they make him some money, while often going on these returns, in buying again they often sell in Chicago for less than they pay for them here.

Farmers that have poor stock can afford to sell for what they can get; there is no money in them to keep; no profit when sold, and often no profit to those that handle them.

Another point should be kept in view by the farmer that has good stock, that is to know their value. When the buyer goes around, and is paying from $20 to $25 for two-year-old steers, and comes to your door and offers you the same price for your grade yearlings, don't be too quick to accept the price offered, for if these yearlings are of a fine quality, as large or larger than the two-year-olds, they are worth for stockers or feeders much more to you, and the buyer knows they will sell for from one to three cents more per pound in Chicago.

Farmers should know the markets, and to know this they must know the grade of their stock in the markets in order to know how much to ask for their stock.

Farmers often ask such outrageous prices for their stock that they are the laughing stock of the buyer, but a man that is posted and wants what they are worth is entitled to respect, and the buyer likes to deal with him, and will handle them, if possible, and take his chances in fooling some other man, that assumes to know it all, and knows but little of what he is talking about.

It does not take a very smart man to learn the price of wheat in Arcadia at any given time, but it requires some in-

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vestigation to have an intelligent understanding of the value of cattle destined for the Chicago market.

Many farmers would make money to take a daily paper and study the markets. Invest a few dollars in the papers and spend some time on them every day and get the run of the markets, rather than being perched on the neighboring dry goods box in the grocery, or perhaps drinking and swapping lies in the saloon.

Farmers have as much good sense as other people in most things, but in matters of business they are sadly lacking.

Much of our success in life depends on a business education, be we farmers or anything else.

A gentleman in the southern part of the state keeps about seventy-five head of grade Shorthorn cows that he breeds every year to pure blooded Shorthorn bulls. He allows the calves to run with their mothers until they are dry or nearly so, and claims he makes money as fast as he could if he milked the cows, and thus saves all the bother and annoyance of the dairy. He milks only one cow and buys his butter.

He feeds all these calves all they will eat and eat clean, from their birth, until two years old past, and then ships them to the Chicago market. He tell me that his cows are as fine as any herd of pedigreed cattle in the state, and he sells his heifers at one year old as high as $50 each. He says he has always kept a pure blooded bull, raised his own cows, and don't know how little other blood his cattle have in them. He does not buy cheap bulls either, but the best he can get, and has paid as high as $600 for a bull to use in order to make these fine steers that will attract attention wherever they go.

His steers weigh generally about 1,400, and bring from six to eight cents per pound, according to the market, at any rate top prices, or about $90 per head, when if he observed the rule adopted here by our farmers he would realize not to exceed $45; for a two year old that would sell for $45 here would be considered a good one.

Now the question is whether it is not better to keep a few

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good steers and keep them well, force them and get a good price, than to keep a large lot and take small prices.

Many farmers say, "I want my stock to eat up the straw, stalks, and rough fodder on my farm, and therefore can't afford to feed much grain." Every farmer that has tried it will testify that no animal will consume rough fodder as well and with such relish as the animal in good condition that is fed grain in the winter season.

Nature demands a certain amount of rough fodder to promote digestion, and no man need fear but what he will have a place for all his rough feed if he only feeds plenty of grain, they are just the things to eat straw and will eat it even if they have hay. Grain and straw is much better than hay and no grain.

I sometimes sell hay when it brings a good price, but I never sold but often buy straw.

When the steer is old enough, and the farmer desires to turn him into money, after he has been accustomed to grain by gradually increasing his feed, then give him all he will eat and eat up clean, just as you would fatten a hog. This puts on flesh the fastest, with the least work; puts it where it is wanted (that is all over the animal), and the butcher will tell you from the handling the animal that has been thus fed, and the connoisseur by the taste on the table.

To make the most of an animal the young thing should never lose the baby fat. Let a calf lose the calf fat and he will never be quite as good in all points as if he had been kept growing.

Any young animal should be kept in good condition. Never let it go back, either in summer or winter, whether for a butcher or for a breeder; and if for the butcher, when the topping off comes give it all its system can handle, and then you will have good meat that will sell well.

This same rule maintains in all kinds of stock used for food, be it cattle, hogs or sheep.

I have no doubt that the most profitable animals destined for the butcher are the early matured things, and this is the sentiment of all that have tried it.

I am much interested in the welfare of the farmers, of

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Trempealeau county especially, and would like them pursue a course of stock raising that will not only be profitable but creditable.

Sheboygan county has almost a world-wide reputation as a dairy county, and other parts of our country are becoming celebrated for some specialty, from which the people are growing rich. This county is well adapted to stock growing, and if our farmers would unitedly work together and try to improve their stock we too may yet hold up our heads and be content. The advantages to our county by such a course are manifold. Farmers would thrive and become rich that are now poor, and the price of land will advance just in proportion as it is made profitable.

I hope our farmers will, as fast as their means will allow, turn their attention to this profitable and pleasurable branch of farming.

REPORT OF COMMITTEE ON RESOLUTIONS.

Resolved, That the sincere thanks of this association be, and are hereby tendered to the citizens of Arcadia and surrounding country for their generous hospitality extended to this association, and the wise and liberal provisions made for the success of this convention.

Resolved, That the thanks of this association are tendered to Gov. Rusk for his earnest endeavor to advance the agricultural interests of Wisconsin, and the cordial support he has always given us as a society.

Resolved, That the earnest thanks of this association are tendered to the Chicago & Northwestern, and Chicago, Milwaukee & St. Paul railroad companies for their liberal action in greatly reducing the rates of freight on all exhibits sent by this association to the New Orleans Exposition, and for a liberal reduction of rates to members attending this convention; in addition, we also thank these companies for the wise and liberal aid and sympathy they have always extended to the promotion of the growth of the dairy interest in Wisconsin.

Resolved, That the thanks of this association are heartily extended to the management of the Green Bay & Minnesota railroad for marked courtesies extended to this association, and for a liberal reduction of rates to members attending this convention.

Resolved, That the earnest thanks of this association are hereby tendered to its officers of the past year for their zeal and wise judgment in administering its affairs, and especially for their efforts in promoting the splendid

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exhibit at New Orleans, whereby the state received great credit and the dairy interest large encouragement.

Resolved, That we give our earnest support to the bill, now before the state legislature, creating a state board of agriculture, and we urge upon our members that they do all in their power to secure the passage of said bill.

Resolved, That we urge upon the state legislature the passage of a bill providing for the publication of not less than 5,000 copies of the proceedings of this association of not more than 250 pages, separate and apart from other reports, to be distributed by the secretary of this society, except —— copies, which shall be distributed as follows: To the governor, 100 copies; to the secretary, 100 copies; to the state librarian, 25 copies; to the agricultural society, 100 copies; to the horticultural society, 50 copies; to the agricultural college, 100 copies; to the northern society, 100 copies; to the state treasurer, 25 copies; to each member of the state legislature, 10 copies.

Resolved, That the association respectfully urge upon the legislature the passage of the Estabrook bill, providing for the holding of farmers' institutes in various portions of the state.

W. D. HOARD,
J. A. SMITH,
Prof. W. A. HENRY,
Committee.

Motion to adopt, seconded and carried.

Convention adjourned to 1:30 P. M. same day.

AFTERNOON SESSION.

Convention met pursuant to adjournment at 1:30 P. M. President Morrison in the chair.

THE GENERAL-PURPOSE COW.

By W. D. HOARD, Editor *Hoard's Dairyman*, Fort Atkinson.

In what I shall have to say on this question I wish first to lay down certain propositions as a guide to myself, and also to explain my purpose and connection.

I. I believe the idea of a general-purpose cow, such as is entertained by, I may say, a majority of farmers and dairymen in Wisconsin and many other states, is a delusion and a snare. I steadfastly believe it to be the greatest obstacle

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that exists to the spread of sound ideas of breeding, based, as these ideas ever must be, on that universal drift in the tendency of all perfected animal life toward *specific* purpose.

II. While I am a steadfast believer in the good effect of sound ideas of breeding in the production of a good and profitable cow, I just as steadfastly believe that erroneous ideas will in their action produce a week "general-purpose" dairyman, and a cow just like him. "As a man thinketh, so is he."

III. I have no fit breed to advocate. What I am trying to do is to endeavor "by as much as in me lies," to disseminate what I conceive to be a true idea of dairy cow; to combat what I believe to be false ideas or notions, and get the farmers of Wisconsin to accept, as fast as it is possible for them to do, sound principles, as applied to their ideas and practice; in other words, to make real, not half-way dairymen of themselves, for to the latter there cometh neither profit nor honor. There is always a big chance for a man to be mistaken. I may be wrong in my notions. Evidently an important portion of the farmers of Wisconsin think so, for their practice shows it. However, I believe I am right, and hence I speak my mind.

I said I believed the general-purpose cow was a delusion and a snare. What is she as a butter producer? Her average yield in Wisconsin is less than 150 lbs. per annum. What is the average worth of that butter? I answer $30, if well made. If made by a general-purpose farmer, $24. What is she as a cheese-producer? Her average yield in Wisconsin is, as near as can be reckoned, 300 lbs. What is that worth? If well made and sold, say $30. That, gentlemen, is what we amount to as general-purpose breeders. Does it pay? Are you satisfied you are a success as compared with specific-purpose breeders. The loose, ill-defined ideas of breeding that prevail among our average farmers are a fearful cost to profitable dairying. It goes without saying that no man can make dairying pay its *best profit* who estimates the cow in any other light than the largest result in milk, butter or cheese. And the fact that so many cheese-factory patrons and butter-makers complain that

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they cannot make their cows pay is only a living, wide illustration of the low standard by which the cow is measured. As an example, select some farmer who keeps, say 14 cows, and devotes them to butter-making. We will suppose that he is a fairly-posted dairymen, understands the value of good care and plenty of feed, and knows how to sell his butter after he has made it. Ask him for the points that govern him in the selection of a cow for his dairy, and in a majority of instances he will tell you he considers size and ability to lay on flesh one of the chief considerations. His reason for this is that when he dries off the cow he can sell her for as much more for beef. That is a general-purpose dairyman. If he buys, it is from a general-purpose standpoint. If he breeds, it will be from a beef rather than from a butter or cheese stand-point. Now, that man is a type of a large proportion of the men who own the cows of Wisconsin. He is the man I desire to take issue with. First, I want him to look over the cows his ideas have produced, and whose record I have given, and then I want him to tell me if he thinks such ideas will ever give us better cows. The cows we have he has bred, and their record is the best answer I can give to that question.

One of the greatest hindrances to the improvement of the dairy cow is this beef notion that so widely prevails among our dairymen. They have only to turn to records of breeding to see the absolute fallacy of it. No reputable breeder dares to mix purposes in his breeding. If we study the history of our domestic animals, we find that, by natural selection, they are divided into specific lines and purposes. This is the universal tendency of nature, and the intelligent breeder conforms to it. The breeder of the thoroughbred or racing horse would laugh at us if we should ask him if he did not think it would not increase the speed of his horses to mix in a little Clydesdale or Norman blood. Yet the lines of purpose are no more distinct in the horse than in the cow. It is only in this way that the principle of "like begets like" can be preserved. The question is, are these ideas correct, and if they are, can any dairyman, whose best profit should be the line of his closest study, afford to ignore them? He

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shows partial obedience to them, when he says he would like a heifer from the best cow in his herd; yet, ignoring the fact that she has no regular line of parentage, one consequence of heredity, he breeds her in a no-purpose manner, and expects the calf will prove as good as the mother. Because she has individual excellence, he erroneously thinks that she will breed from her udder rather than from her own parentage, and that of her mate. It is strange to me that, with all the discussion that has been had on the laws of heredity, that our average dairymen should so generally set them at defiance, or even show indifference to them.

It is only by adhering to a strict construction of the law of heredity that anything like a certainty of result can be obtained in the production of a good and profitable animal. The race-horse breeder knows it; the draft-horse breeder knows it; the fine-wool breeder knows it; the mutton-breeder knows it; the breeder for beef knows it; all intelligent breeders for milk know it. All these are religiously obedient except the average dairyman, the very man of all others to whom a profitable cow is a prime object. He shuts his eye to law and sound practice, and goes in for confusion, worse confounded. He must believe in his practice, or else he would not so tenaciously adhere to it. The work he has constructed, in other words, the cow of his hands, and her results, remind me of the Frenchman's description of an old-fashioned tipple called flip.

"A leetle brandy to make him strong, a leetle vater to make him weak, a leetle lemon to make him sour, and a leetle sugar to make him sweet. Zat make une grand confusion in my mindt."

There is not a farmer in Wisconsin that has ever had any chance to observe the results obtained from the Jersey or Guernsey cow in butter, the Holstein or Ayrshire in flow of milk and cheese production, the Shorthorn, Hereford or Polled Angus in beef, but must see that the best and most profitable results can only be obtained by adhering to these long and well established lines, then let him measure his "all-sorts," "general purpose" cow, with these, and how does she compare? Still farther, suppose he attempts to im-

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prove her progeny, will he select a male of her kind? This shows us, gentlemen, the value of right ideas, and how much influence ideas, either good or bad, have on the result of our labor. Specific purpose, not general purpose, has given us the magnificent breeds of cattle I have montioned.

Look now at the sharp contrast in result. The general-purpose cow of Wisconsin yields an average of 150 pounds of butter a year. The very best may possibly reach 300 pounds. The best specifically bred butter cow in the world yields 803 pounds of butter in 328 days, and 38 pounds of butter in one week. The general-purpose cow of our average dairies yields an average, say, of 300 pounds of cheese a year, or a milk flow of 3,000 pounds a year (and I very much doubt if she does even this). The best specifically bred cheese cow, a Holstein, astonishes us with a yield of 23,870 pounds a year, which, if made into cheese, would make at least 2,000 pounds.

There stands the record before you. Which line of practice, which set of ideas will in the end give us the largest number of good cows? We cannot keep on in this business and hope to stand up against all vicissitudes that threaten, unless there is a rapid improvement in the character of our cows as in everything else.

Why, we can hardly compete to-day in the English cheese market with the Hollander, who makes cheese from cows worth $150 apiece, fed on land that he pays $30 an acre rental for, and which is worth $500 to $700 an acre. These are sober facts. How does he do it? The answer is very simple. He does not milk a general-purpose cow. His cow has been bred for a hundred years for one specific purpose, and like a thorough-bred trotter, it is hard for dunghills to overtake her.

If I were asked to define what I considered the chief excellence of a prime dairy cow, I would answer, the power to transmit her qualities, with a good degree of certainty, to her offspring. I can find thousands of good cows who have individual excellence, but they were not bred for any specific purpose, and their excellence will die with them. Right here is seen the value to a dairyman of correct notions con-

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cerning breeding; right here, in the question of offspring, is where "blood tells."

The difficulty in Wisconsin, as I have said many times before, is that the men who are keeping the cows are not dairymen in the true or most profitable sense of the word. They are wheat farmers commencing to keep cows. They are slow to believe that the breeding of the dairy cow, the care and feeding of a cow; in a single word, "dairying" should be made the principal business of the farm. The farmer here in Trempealeau county may not be in as good shape to do this as the farmers around Elgin, but he can get his ideas on the right track and then, under their lead, push forward.

Dairying, as a distinctive pursuit and principal business on the farm, is yet in its infancy in Wisconsin. It is only fourteen years, gentlemen, since the total capital invested in cheese factories in this state was only $18,000. There has been a tremendous cutting down of erroneous notions among our farmers in that short space of time, and more correct ideas have taken their place. Only fourteen years ago it was a common idea among Wisconsin farmers that cultivated grasses would never prove a success here, and yet there is no state in the Union that can now excel it in this particular in proportion to the number of acres so cultivated. What has dispelled this wrong notion and made thousands of grass-blades grow where one grew before?

The cow has done it; or, in other words, dairy education. But this is only one example. There has been encouraging progress in the growth of right ideas in other directions, among which are the proper care and feed of cows, the construction of suitable barns, the providing of good, pure water, and in easy abundance, the knowledge of the laws that govern the making of fine butter in place of the universal grease of a few years ago, the making of fine cheese that to-day commands the respect of the best markets of the world—all these are triumps of no mean order. But a vast amount of underbrush had to be cleared away from the agricultural mind before this good seed could be sown and have a fair chance to bear a harvest that should awaken the

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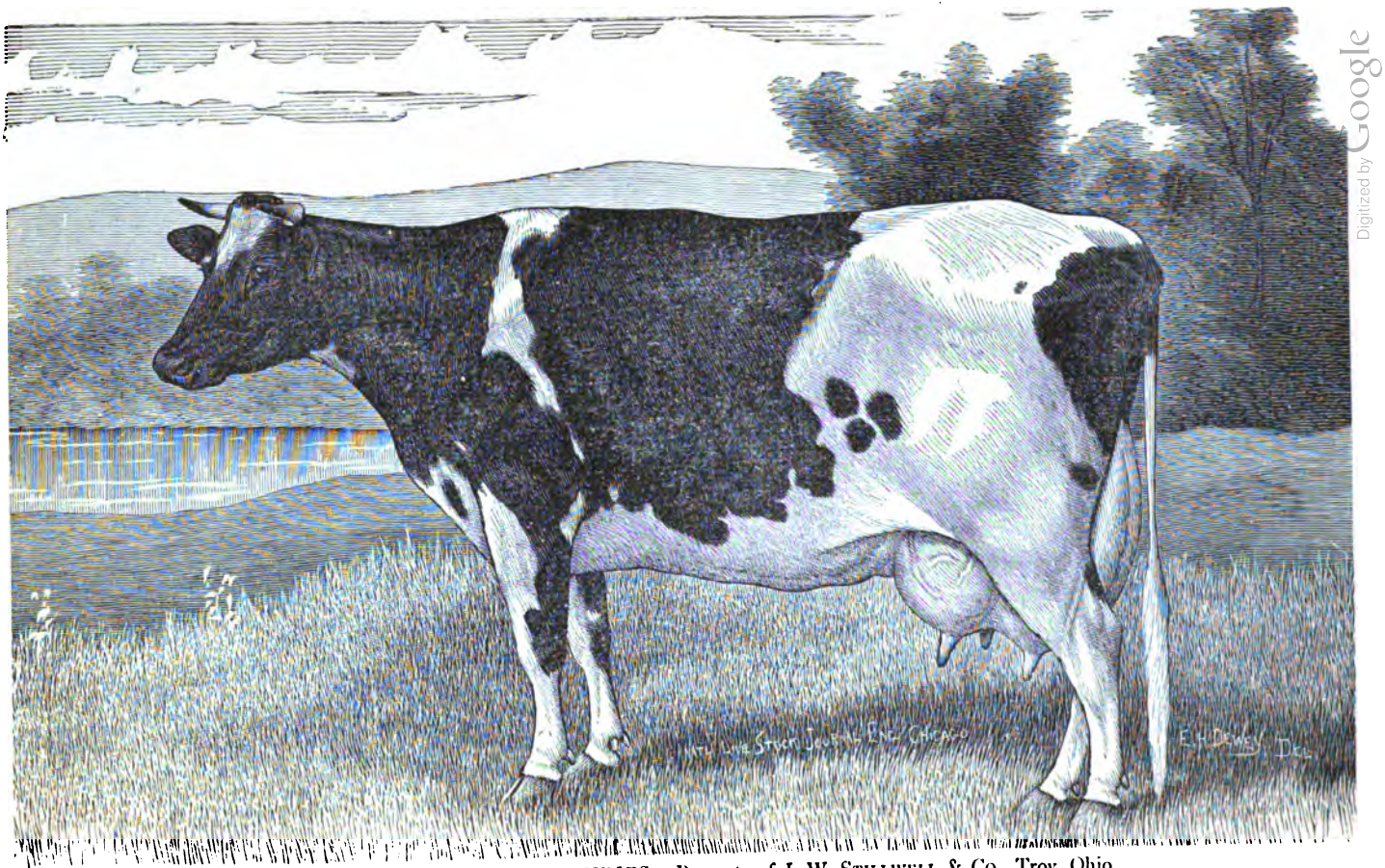

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Record 3,404 lbs. of milk in 30 days; 121 lbs. 12 oz. of butter in 30 days.

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pride, stimulate the thought, enlarge the knowledge, and enhance the profits of the Wisconsin farmer. Just in proportion, then, as he has allowed himself to become obedient to the advanced teachings of dairy science, has he made progress; just in proportion as he has refused to do this, is he a relic of the unprofitable past. The tape-line that every dairyman should measure himself and his business by, it seems to me, should be this: What are the ideas that govern the most successful dairymen in the conduct of their business? Second, How are those ideas carried out? Third, How shall I, the soonest possible, place myself in contact with such ideas and practice? Let any man that can barely read, and who has an average quality of brain and energy, set those three propositions squarely before him and become obedient to their deductions, and his success is assured. But every man will learn, sooner or late, cheaply, or at sore cost, depending on the man, that ignorance and wrong ideas in this business are the dearest freight he can carry. When he goes into partnership with the cow, he will find that the old, easy, indifferent, slip-shod notions of wheat farming will not do at all. He has come into the domain of brains where knowledge, and not main strength, is power. He must feed his mind with dairy knowledge. If he is too stingy to do that, he had better stick to his wheat, even if it is only fifty cents a bushel, for there he can depend on an occasional streak of good luck, but in dairying never.

DISCUSSION.

Mr. Clark — Has Brother Hoard had any experience in dairying with these same breeds, and strains of cows that he had been recommending to these people?

Mr. Hoard — Yes, my experience in dairying is based upon the fact of being well born in the first place. I say it with pride gentlemen, with an honest pride, I come from good stock, and so far as abundance of food was concerned, it was Jersey. My father was one of the best dairymen I ever knew in my life, he was not large in his operations but he was very successful. My father was not a breeder to the

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extent that many are, still he was among the first that ever introduced the Devon in that section of the state of New York; the Devon was his butter cow. So far as my personal experience, I am not at the present time engaged in dairying, but my observations with regard to these laws are based upon study of the nature of these things. My ideas of this matter are based upon a verdict that I see in nature and the most successful way of doing business.

Question — Have you ever seen a man more successful than Mr. White, who averaged $70 per cow per year?

Mr. Hoard — Yes, I told you Mr. Goodrich averaged $84.49.

Question — How many cows did he keep?

Mr. Hoard — Fourteen; then Mr. Oatman of Oatman Bros. kept 64 cows and they averaged him $84 and over a year.

Prof. Henry — What kind of cows does he keep?

Answer — Holstein grades; he makes his milk into butter and cheese; one other thing I want to add, I hear dairymen talking about size. If I was a dairymen I wouldn't pay any attention to any other purpose than that, I would either go steadily straight towards cheese making or towards butter making and adhere to it. If a man wants to make the largest amount of butter at the least expense, and the largest profit to himself, he certainly ought to take advantage of one hundred years of effort to produce a dairy cow. Now, a large number of men want Shorthorns, they say they are good dairy cows.

Now I say the two things cannot occupy the same spac at the same time, even the Almighty himself cannot do that. No dairy cow ever yet was a square block and legs put under her, and the principle that makes a Durham a beef animal is that one principle of heredity. If she is worth anything at all as a beef animal to produce beef, and give you a certain result as a beef animal, it lies in the fact that she has been steadily bred to that purpose. Turn around and see how it is with the Jersey. She has been steadily bred to extract the largest amount of butter fat out of the smallest amount of feed in proportion. She is a peculiar organism. She takes some feed and she will surely give you a large

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proportion out of it. Feed the same food to the Durham and you get your large amount of flesh. Feed your same food again to the Holstein and it becomes converted in another direction. It is a result in the difference in the machinery. That machinery has been established by long lines of effort. A gentleman over in our county was not satisfied with a Clydesdale horse; said he was worthless. I said, why? He is purely Clydesdale. He said "Oh, yes, but he has only three crosses in him." His ancestry had not been established long enough so he did not throw towards the lower forms. So it is the principles of heredity are demonstrated. My friend, Hiram Smith, several years ago didn't believe much in this principle, but he has been a close observer, and he told me some time ago of an experiment he had made with three different sets of cows, two good common cows, two Ayrshires, and two Jerseys, and he found the common cows made a pound and a quarter of butter to the cow; the Ayrshires made a pound and a half, and the Jerseys a pound and three quarters to the cow.

The Jerseys, you see, had not near the size, but they had the distinctive elements in them to make butter. You see with these facts staring a man in the face he would be insane in his own business if he said, "Oh, well, I prefer that cow because when I get through with her, she will make me five hundred pounds more beef than the others." Let us figure that. Here is a native cow, made a pound and a quarter and the Jersey made a half a pound more a day, that was worth, at the price he is getting on the average, thirty-two cents, sixteen cents a day apiece, the average production as they would run along would naturally make it $50 a year difference. But suppose it gains only $25 a year more. Well, now the average life of a cow we will say is eight years, and at $25 you have in one cow $200 on the one side and 500 pounds of beef more on the other side. I have heard hundreds of men say they would not have a little cow. Mr. Phelps had a little cow that made fifteen pounds of butter on grass in a week, and she didn't weigh nine hundred pounds. How long do you think that little cow would have to continue making fifteen pounds a week to pay for a dozen

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cows of the larger size that make less. So I say, let us look towards the final outcome of this matter. Become dairymen. We can't be everything. We can't do everything, but if we adhere to these purposes, then we take our own skill from others, we enlarge our capacity and our powers.

Twenty-eight years ago I worked for a man in the state of New York, where I made the butter and cheese from forty-five cows. He had a cow he called "Old Hanner," one of the most wonderful milkers I ever saw. She was of strong Durham descent. He had saved from that cow five heifer calves, and he never got one worth a cent. They were absolute failures. You see that cow had an individual power that made her a large milker; but when she gave that power to her young it dated back, don't you see; within the principles of heredity, and her children took her character as she, from her ancestor but not as she gave into the pail.

Mr. Favill — Do you know of any breed that will raise us universally good calves, good heifers?

Mr. Hoard — No, sir, I do not, the exceptions are altogether too large, but I do know of certain breeds that give you more good cows, and that is how I get at it.

Mr. Favill — I don't want to go back on the Jerseys at all, but suppose you raise Jersey cows and not more than half of them prove good milkers, what are you going to do with the rest?

Mr. Curtis — Does it cost any more to develop a thousand weight of meat in the Jersey than it does a thousand weight of meat in the beef animal?

Mr. Favill — I guess it wouldn't; but if a Jersey proves not to be a good milker, she is of pretty light weight. If we raise a large animal and she proves not to be a good milker, there is lots of beef in it.

Mr. Hoard — The question is, can you make more money by raising beef than you can by producing butter and cheese. Do you intend to go into your milk breed after your beef? Of course not.

Mr. Favill — I am doing it then, for I am raising grade

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Durhams, but I've got some tip-top good milkers, and if I get good milkers, I don't care if she is any breed or not.

Mr. Hoard — Would you go over to the Jerseys or over to the Holsteins after your best beef product?

Mr. Favill — No, I wouldn't; I would go to the Durhams and Herefords if I was going to have one exclusively, but I want both.

Mr. Gorton — We want to learn something while you are here. We want to know what is best for us to do up here; would you recommend us to raise Jerseys exclusively?

Mr. Hoard — I would do the best I could; I want you to understand I have been striving after the idea that the dairyman should himself strive toward a specific purpose; suppose one of you farmers has made up his mind that he is going into dairying as a private dairyman to make butter. He is going to put his time and labor into it, he wants to get the best results, and I say if he undertakes to put beef between him and his purpose, he will loose money. Or suppose he is going into making cheese, let him select a class of cows that will give him the largest flow of good milk and the longest flow, not a short season cow. Let these things come in a straight line; that is the idea I am trying to get at.

Mr. Gorton — What I want is to know whether you would recommend us to do any such thing ?

Mr. Hoard — I would recommend to any farmer to do it, to go to work and put a Cooley creamer, or any other good creamer, into his milk-room and make this effort towards becoming a good, A No. 1, dairyman. There's a good solid future to that. Any farmer can become a good dairyman if he will just start out with that purpose, and select his cows specifically for that purpose.

Prof. Henry — I hope this convention will bring out the wants of this portion of Wisconsin. There are farmers here who have come thirty or forty miles, and if they are going to feel that they are paid, they want to speak right up on this most important question. You haven't got as good cattle up here as you ought to have. These cattle that rustle out here under the oak trees are a pretty hard set. Your

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three-year-old steers are not as big as our two-year-old steers in our part of the state.

Mr. Clark — Isn't there as many in the dairy business in this state that have grade Durhams as Jerseys?

Prof. Henry — Yes, I think there are.

Question — And which men are succeeding the best in their business?

Prof. Henry — The men that are succeeding the best as butter men, are the men that have Jersey cattle as grades. The point of all this is that it does not pay to strive after both beef qualities and dairy qualities. You never hear beef men talking about the dairy qualities of their beef. Now in a dairy convention when the farmers are coming here to seek for light, I say we don't want to throw the dairymen off the track. When I go to a Shorthorn convention, I will throw my hat for Shorthorns that have been breeding for a hundred years for beef. I saw cattle in Chicago that weighd fifteen hundred pounds, and they kept eating until they could hardly stand. In a Shorthorn show that is what they are exhibiting, the great weight of beef.

Mr. Curtis — Mr. Camden, of New York state, who sold the "Duchess," the $40,000 cow of which you have all heard, used to always keep a native cow to feed the calves because the Shorthorn did not give milk enough to support them.

Mr. Favill — If I could raise calves that would sell for $40,000, I would keep two or three common cows to raise the calves.

WHAT SHALL WE DO WITH THE SKIM-MILK?

By Mr. STEPHEN FAVILL, Delavan.

The question assigned to me has been so often discussed in our conventions, it seems to me all has been said upon it that is necessary to a full understanding of the whole subject, and I am of opinion that the need of to-day is not so much knowledge as conscience in this matter, for I verily believe there are no cheese-makers to-day engaged in the manufacture of skim cheese but know that they are making

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an article of very little commercial food value, and they know, too, that the final outcome of this business will be disastrous to the cheese trade of the country. But I am aware that the cheese-makers are not alone to blame. The patrons of factories could stand a good deal more conscience in this matter, and not be injured by it, and, in addition, a large invoice of commercial intelligence might be distributed among them, greatly to their advantage, and to the advantage of the cheese trade generally.

The factory men's excuse for making skim-cheese is that their patrons demand it; and the demand is made upon the factory men in the hope that a little more present money will be made than could be made from butter or cheese alone.

They do not stop to inquire whether they are doing a legitimate business, or what the final effect will be upon the cheese trade. A little present gain is allowed to outweigh all commercial considerations. I am speaking of our commercial reputation. All know how difficult it is to establish a good reputation, and how very easy and how little time it takes to entirely destroy it. The history of the cheese trade in this country for the last fifteen or eighteen years will demonstrate just what I mean.

Those of you who remember our cheese trade in its infancy will remember the prejudice that existed against Wisconsin cheese; will remember the time when the Chicago dealers bought the best of our cheese, took it to Chicago, branded it "New York factory," and sold it as such. Why, I ask, was this deception? Simply because New York state had a national reputation for the excellence of her cheese, and the Chicago dealers took advantage of it, and made it a source of profit to themselves. A little more of the history of these times may be interesting and help to illustrate the point I am trying to make. Several of the cheese-makers of those early days, when they detected the fraud being practiced by the Chicago dealers, said if our cheese is good enough so it can be sold in Chicago as New York factory, why will it not sell in New York, and we at once took the "bull by the horns" and, instead of sending our cheese to

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Chicago, we sent it direct to New York. The practice of making skimmed milk cheese in the west had its beginning about Elgin, Ills. Some butter and cheese factories combined were started there about 1870, and, while the number was quite small, the results were quite satisfactory: But they soon spread over the state of Illinois, and as the demand for skim-cheese was quite limited, it soon became a drug on the market, and, of course, they failed to reap the golden harvest they anticipated. During these years Wisconsin was making only whole-milk cheese.

Then followed the centennial show, which resulted in placing Wisconsin in the front rank in regard to the quality of her cheese, so that from 1876 to 1880 our cheese was considered of sufficient importance in the New York market to demand a special market quotation.

But since that time the childish desire to "eat our cake and *sell* it too," seems to have taken possession of many of our dairymen, and they have been making skim-cheese and butter from the same milk, and the result is, we have lost the enviable and profitable reputation we once had in the markets of the world.

Mr. Hoard, of the Jefferson County *Union*, is my authority for saying that Canadian cheese to-day is worth from 1 to 2 cents per lb. more than our best, and the reason is mainly due to the fact that they have kept the skimmer away from the cheese vat. They have the reputation of making first-class whole milk-goods, and buyers take it, knowing they are not going to be swindled. The question may be asked, cannot the expert tell whether it is skimmed or not? I answer yes, after it is cured; but for the first 15 days from the press, the skim and whole-milk are so nearly alike that it is very difficulty to tell to what extent (if any) the skimmer has been used. Both are tough and tasteless until the curing has gone on to a certain stage, then it is very easy to detect the loss of the cream. The one remains tough and tasteless, the other grows mellow and soft and palatable. But for the sake of the argument, we will suppose this cheese has been sold every time from factory to retailer, and suppose the retailer is particular to tell his

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customer that he is selling him skim-cheese, then you ask, what harm has been done? I answer, the whole transaction is just calculated to defeat the object we have in view, viz., the building up of the cheese trade. Let us look at this matter a little. To accomplish a commercial transaction three things are necessary: First, something to sell; secondly, somebody to sell it to; and thirdly, somebody who wants to buy what we have to sell.

Now, apply this to the cheese trade. It is a well known fact that the taste for many kinds of food is largely cultivated. We learn to like many things by eating them, for which we cared but little when we commenced to use them. Cheese is one of these things and one, too, that is bought rather as a luxury at first. Now, suppose the purchaser (because he can get it a little cheaper) buys a piece of skimmed. It is put upon the table; the family nibble away at it a while; none of them like it, and, of course, eat but little of it, and it dries up, and the final result is, part of it is thrown away, and the family come to the conclusion that they do not care much for cheese anyway, and the disaster to the trade is in the fact that they do not buy any more. But suppose that instead of buying the skim goods, the purchase has been made of a good, mellow, rich, toothsome piece, made from whole-milk, the results would be just the opposite of what I have described. Every member of the family would have relished his allowance, and the whole would be consumed, and at the same time the taste for cheese would be cultivated, so instead of deciding they were not fond of cheese, and the conclusion arrived at not to buy any more, the order would be given for another and larger piece of the same kind of goods.

Gentlemen, cheese-makers and patrons of cheese factories — you all know that what I am telling you is true, and yet for a paltry pittance of present gain, you are willing to ruin the golden reputation we have had in the markets of the world. I say golden reputation, and I mean just what I say. A good reputation means dollars and cents in our pockets, and loss of it, we shall find to our sorrow, means empty purses. I come now to answer the question given

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me, viz.: "What shall we do with our skim-milk?" You will understand from what I have said, I am not in favor of making it into cheese. What shall we do with it? I answer — feed it to your hogs or calves, and if you have neither, feed it to your cows. Almost any cow can be taught to eat it, by mixing a little mill feed with it, and I will guarantee that the increased amount of milk will pay much better than to make it into cheese, and we run no risk of injury to the cheese trade. I am confident, taking the years together, we can get as much money from feeding the milk as we would to make into cheese, and just now there is a large balance in favor of feeding. If the market quotations are reliable, the price at which the cheese will sell now will not pay the making, boxing, and transportation to market. You will understand that I regard skimmed milk as very valuable for feeding purposes.

Skimmed milk, if fed sweet, will grow a calf or pig almost as fast as whole-milk. Of course it will not fatten so rapidly, but will make nearly as much growth, and that is what we are after in the young animal more than fat.

I can not give the exact value of skim-milk, either for feeding or for cheese-making, but am fully satisfied that, leaving all commercial considerations out of the question, the gain in cheese-making over feeding is a mere pittance. But when we take the commercial view of the question into the reckoning, the balance will be largely in favor of feeding. Then, I say, keep the skimmer away from the cheese vat. Make either butter or cheese as seems best for you, but do not try to make both from the same milk.

Song by Glee Club.

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DO HARD TIMES GIVE US THE RIGHT TO DOUBT THE PROFITABLE RESULTS OF GOOD DAIRYING.

By J. A. SMITH, Dairy Editor *Cedarburg News*, Cedarburg.

In the consideration of this question, we are not to assume that the great changes which take place in the commercial value of all other productions of the soil, or the mines, or the fisheries, are not to affect the value of the products of the dairy; but whether amid all the disasters and financial crises that we see occasionally overtake most industries, the business of daiying enjoys so much more a charmed life than other leading industries, that the ordinary experiences of "hard times," so called, have less of financial terror and trouble in them than pertain to other agricultural pursuits.

If I answer the question in the affirmative, and have any success in establishing the truth of the answer, it will be because there is some vital reason for the business being less affected than other agricultural interests by periodical revulsions, that in part at least, stop the plows, that put out the furnace fires, that still the loom, that close the manufactories, that greatly lessen the value of the muscle in the laborer's arm, and reduce the price of bread far below the compensating wage of production.

To attempt to find that vital reason, or reasons, is all the apology that can be made for breaking the silence. Whittier long years ago sang:

"The one sole sacred thing beneath the cope of Heaven is man,"

and we may add, it is the thought of man that makes the one sacred and most valuable element in him. It would follow, then, that the higher and better and more practical and useful the thought, the more value it has, and the less able is the world to get along without its use; and therefore the more solid is the industry that is founded on that thought. The crude thought is enough for the crude age, and is sufficient basis for the industries of that crude age; but the high

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and refined thought of a well-developed civilization makes for itself industries as solid as its own foundation. For illustration: The vast system of railways that span the continents, resulting from the initial thought that made the first one, has created a condition of civilization and development that makes their continuation and extention imperative, and thus makes one of the most solid industries, because the man it has advanced must have the railway to maintain his advanced position. For another illustration: The cultivated ear calls for the symphonies of the song and the strains from ten thousand of harps, and thus makes the world of music part of the solid realities of existence, and as a consequence has created an industry as solid almost as that of the production of bread, and an industry the savage does not know. Still another — the most potent that has ever blessed the world — the thought involved in the movable and revolving type made learning accessible and cheap, and has created an industry that is vast, and is indispensable as the most conserving power of civilization and progress.

So we might go on — but it is needless — and show that the continued utilization of the high thought involved in the conception of these instrumentalities of modern civilization and development, and which the ancients and the present savages, and the low-keyed men not strictly savages, then lived, and now live without, is the one thing that is to keep moving forward the finger on the dial of progress.

While it may be conceded that there are numerous superfluous vanities of our modern civilization that may easily be dispensed with in stringent times, it must be held there is much that that civilization requires and must have, and does have, except when bare existence is the only question, and men become nearly as wolfish as the animal that is said to be "at the door," when starvation is nigh. Bare existence is not civilization. If to avert absolute starvation of the people of the land were the vital question; if the fruition of civilization, religion, and statesmanship, and our chief farming industries, had no other end or aim than to do that, and the most direct means were but barely adequate, then I

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would not hold that butter and cheese-making would be less liable to collapse, and more remunerative than the raising of bread; I would then no more so hold than that music is better than bread for a famishing army. But given the world's acquired capital and tastes — its splendid civilization and its essential instrumentalities — and that we are not going backwards and downwards, then I say the higher and the better the thought that lies at the basis of our needs and comforts and enjoyments, so much the more solidity is there in the industries that supply such wants. If we are to have continued the development we have to-day, then it is still going to subsist upon the natural and essential elements of its growth.

Now, if modern dairying is one of the accompaniments of an advanced civilization, then it is anchored to the latter in the nature of things, and will be part of it. We find it originated with, and has followed the fortunes of the proselyting hosts of civilization, that inch by inch, and through long centuries, have marched from ancient Persia across Europe, across America, and are now assaulting its ancient home — Asia — from its eastern shore. So we may conclude it has come to stay. I admit that if the wheels of progress are to roll back, and "chaos and old night" are to come again, that such "hard times" as would then ensue would "give us the right to doubt the profitable results of good dairying," for the condition of the savage calls only for the food of the savage; and Jersey creamery butter is not one of the items in his "bill of fare." But if we are not going back to the embrace of ignorance and barbarism, then the advances that show how far we have moved on and up from these conditions are to be among the cherished objects to be kept and transmitted.

I said, in the first place, that the object in breaking the silence, was to find the vital reason for the permanent and respected position of the dairy interest among the industries of the world; and we find it to be its close alliance with the essential conditions of an advanced civilization. I will now add that if the stability of the business has not been proved

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by the facts of the past, then the inferences from the reasoning, would, as a guide for the future, be utterly valueless.

The constant iteration of the term "hard times," suggests a definition of what they really signify. Whatever other definition may be given to them, and however much all may be affected by their general presence in the financial affairs of the world, the vital definition I apprehend to be a condition in which more is spent than is being earned, or a condition in which production costs more than the value of the receipts from sale. The cruel and spirit-crucifying results of hard times are best known to the man who, having no other legitimate source of income but his labor, either finds there is no demand for it, or, if wanted at all, is wanted at wages below cost of inexorable consumption. They strike with next greatest force the men who are manufacturers, whether farmers or mill-owners, engaged in working the soil, or wood, iron, wool, cotton, or grain, who find their products, when sold, do not cover the cost of production. They experience the same financial pangs as the workman, who either does not or can not earn as much as he consumes, and often have added to their miseries, blame for not being almighty enough to be able to coin a profit from a losing business. It is undeniable that the general influences of hard times have taken their fiercest hold on laborers without cash capital, or farms, or manufactories, and their next fiercest hold on those whose capital is invested in general, mixed, or exclusive grain farming and in large manufacturing enterprises for the employment of labor, and of the trustee who owes for an unsold or a trusted-out stock, and have laid their hands lightest on the good dairy farmer, who, through his own skill, if he really has it, or through the use of cheese-factories and creameries, gets a good profit from his labor, for the reason that its products — milk, first-class butter and cheese — have sold so far above the costs of production that he is not in the same class with those who spend as much or more than they get back in performing their labor.

Now, these are the solid facts of the business to-day, right in the midst of the present general depression, and the same

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facts were patent before the war of the rebellion; during the war in 1868, when the oozing of the water out of our currency commenced to ooze financial blood; in 1873, when the collapse came; in 1878, when bloodier water was wrung out in preparation for redemption; and after it came, and held good through all times; when nearly all other branches of business were in financial throes, and it prospered more still when others prospered. Those of us who lived in those times know that the prices for nearly all kinds of property responded to the inflated condition of the currency that paid for it, and that when the water went out of the currency, it also took with it the nominal value of the property measured by it. But the good dairy farm was the exception to the rule. What I mean by this is, that the well managed and full stocked dairy farm has not been worth less at any time, or been sold for less as a rule, than it was worth in currency during and soon after the war. The same may be said of the cows on it, while nearly every other kind of property suffered, general real estate included. This is not speculation; it is history, and the chief dairy sections of the west, at least, contain the proof. Now, if in matters political, as Patrick Henry held, there was no surer way to judge the future than from the past, then is it not as good a rule as mortals have by which to estimate the future prospects of the essential industries of the land?

While it may be contended by some that the theories and reasons I have adduced, fortified as they are by the facts that have existed through long years of successful experience by many of the best-known dairymen of the west, ought to be deemed conclusive, yet the novice and those partly skeptical, and, toughest class of all, those who have only half tried and failed, will toss all these considerations and histories aside, and will raise what they appreciate as a more vital question to them, this: "We know, to a certainty, that wheat, in the Chicago market, for the crop of 1884, was sold till the bulk of it was out of first hands, at less than seventy-five cents per bushel; and we further know that raising wheat at that price is pretty near blue ruin to the exclusive grain farmers of Wisconsin, living 200 miles or more from market, and

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using land that cost from $40 to $80 per acre; now, what assurance is there that the dairy business will not go the same way?" This is a legitimate inquiry for this class of men. But I greatly fear that if they should completely fail to take note of the views I have adduced, that all I might say from another stand-point would be of but little more use to them, as an aid in deciding, than to toss a penny. But we may safely assume that the anxious inquirer has accepted some fundamental truths of the business as proved, and is, therefore, ready to accept more.

One strong reason why the dairy business will not go the same way of exclusive grain raising is, that it has within itself the power of continued reproduction; while exclusive grain raising, as conducted by very nearly all its followers, does not contain within itself the power of continued existence. To "new fields and pastures green," is its ever-ringing slogan; while the depleted soil it uses for a few years, if not abandoned, has to be put to other uses, or tilled for lower wages and lessened profits. To explain further on this point, I will say that I once heard one of the large dairy farmers of the state say, in one of our conventions, that if he could raise wheat for a life-time, and his children after him, producing each year twenty bushels per acre, as he did at first, that he would not be so ardent a dairy farmer; but he knew he could not, and did know that he could make each acre produce 2,000 lbs. of milk, and could even make a gain on that; and that he had rather take his chances in the market in the race for dollars with 100 lbs. of milk than with one bushel of wheat. He said he further knew that if he cropped his land, then worth $50 per acre, to wheat for ten years that it would not be worth, to farm or for any purpose, more than $40 per acre; while he knew as well that if he devoted it to almost exclusive dairying, that he would have a sure yearly income as great as the very best years for wheat would produce, and at the end of the ten years would have a highly fertilized farm instead of an impoverished one; one actually worth double the one wheat-raising would leave him for money-earning purposes. He would thus, through the cow, create another farm inside of his own fences. He

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therefore held there should be added, as income from the cow, the increased value she put upon the soil. Estimating that each cow fertilized three acres, and added $120 to their value in ten years, then she really earned $12 per annum, besides the value of her milk and calf. I must say, however, that he was a man who made his cows produce him more than 6,000 lbs. of milk each per annum. I would not want the keeper of starved cows, that yield only starved milk and manure, to infer he could make the same gain, for he would be disappointed.

The experience of this gentleman is by no means an individual or a rare one. I have patrons who find it not hard of accomplishment, by the aid of cows, to lay aside the interest at 7 per cent. on all the land they occupy as dairymen at a valuation of $100 per acre, besides paying all costs of keep and labor. I know grain farmers in the same time who could not pay three per cent. on their farms at $25 per acre. I could call up the living witnesses here from the practical and honored dairymen who have and who will address you, to prove that they are making their own farms do as well or better than those farming the $100 dairy farms.

It is only fair to say that such results are not achieved by the cow alone. It needs a man at the helm with a fertilized brain as surely as it needs the good cow and the fertilized soil. The man who does not see hell in ignorance and rags, in dilapidated barns, houses, and fences, and in milking scare-crow stock in mud and rain, and does see a congenial heaven through rifted clouds of tobacco smoke from short pipes and drinks in its beatitudes from the upturned whisky jug, had better keep out of the dairy business. Such a man needs civilization more than he does the high school teachings of the æsthetic dairyman.

Another reason for putting confidence in the solidity and stability of the dairy business is, that there is likely to be no sudden or long-continued depression in it because of over-production, for the reason that it is practically impossible to quickly and greatly augment the supply of dairy

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products, so as to greatly change the operation of the law of supply and demand, as can be done in producing pork, mutton and wool, for it takes from three to five years to produce the good-paying cow, while a large percentage of those started on the way as dairy cows go to the butchers' block for one reason or another before they reach the age of five years. The increase is, therefore, gradual and slow. There are nearly four persons in the United States to each milch cow, and the ratio of increase of the people is greater than that of the cows. Besides, the field for an increase of sales outside of our own domain, notably for cheese, is larger than it is for an expansion of our market for most other products of our soil. Dairy products will bear transportation farther than less concentrated food. There is also less likelihood of the undeveloped people of other nations undertaking the manufacture of butter and cheese than there is of their producing other foods on their own soil. Men can eat and relish, and pay for good butter and cheese, who have not the capital, cleanliness, or education to make either. India, Russia, and Australia can walk right into the wheat and meat markets of western Europe and compete with us, so that cheaper labor and production seem to be the only refuge for the American farmer who produces only wheat and meat. But it will be a long time before East India butter and cheese will modify the price of American dairy products. Being a child of intelligence, cleanliness, and a high civilization, the people who can father it will naturally reap the avails of the labor of the child. The monopoly of the shoemaker's business by the St. Crispins is not more surely theirs so long as children are born barefooted, than is the monopoly of gilt-edged butter and cheese-making secured to cleanliness, persistent good habits, and educated brains. It is largely confined now to the very best and highest developed portions of the world; and, indeed, we might ensmall the limits and say it is largely confined in this country to to the most intelligent and cultured portions of our own land. While this is true when we look for actually accomplished work, it is also true that the cow is the most quickly, radical and effective reformer there is

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abroad in the land. A man in Georgia has been converted by her into a thoroughbred, practical abolitionist, through her proving, by the arithmetic, that there is more clear profit from each Jersey cow now than there was in the working slave before the war. While it takes a certain amount of brains to appreciate the instrumentality, you may be sure that intelligence, refinement and a religion that is worth having, will flourish and abide more securely wherever the fifteen-pounds-of-butter-to-the-week cow preaches her glad tidings.

Again, the sales of many products do not altogether depend upon the times. It may not be flattering to our human nature to be told that we, as a race, independent in our prosperity, give a more remunerative and reliable market to some products that administer to our vices and bad habits and tastes less harmful, than we do often to the prime necessities of life. But it is true, all the same. It is said to be a historic fact that when the early settlers of one of our lake cities had only money enough at the end of a long winter to buy of a passing vessel either a barrel of whisky or a barrel of pork, they took the whisky. If they had really been out of material for bread, perhaps — and only perhaps — they would have decided differently. The reliable market for liquor and tobacco attests the truth of what I am saying — that articles of useless indulgence, and worse, of positive harm, are often less affected by stringent times than those of actual necessity. The gawky boy whose rapid growth had stuck his legs far through his pants, and who could cheerfully go to church barefooted, but was really suffering for a bosom-pin, was but a a type of the men who, through good times and hard times, keep the liquor and tobacco industries on a solid financial basis, even if their stock goes unhoused, or they have to wear rags and leaky boots to do it. While nearly all the rest of the material world is temporarily unjointed, wrestling with the conditions imposed by over-production and non-consumption, they manage to exempt the whisky and tobacco business from commercial agonies through steady consumption. Habit and vitiated tastes, more than stern necessity, fix the measure of con-

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sumption with those who have plenty of money, and also with those who divert money from more imperative uses. The dairy business gets the benefit of the same weakness in human nature — though it is a cleanly and harmless weakness — for the chief commercial product manufactured from milk, butter, which in this country has four times the weight and nine times the value of all the cheese made, of course, is no such disgusting and deleterious product as whisky or tobacco, yet it can not be denied that its use is largely dependent on habit, and that rigid economy, even that not born of poverty and semi-starvation, might strike it from the *menu* among the first of dispensable articles; yet, because of acquired tastes and because the average consumer in America has yet to learn experimentally, the meaning of agonizing poverty, but little of it is discarded for that reason, and hence one cause of the solidity of the dairy business. Its vast consumption at prices higher in gold than those that rule in any other nation of the world, is a measure of the enjoyment and prosperity of the American people. It is a commercial fact that the best of it can not be exported, and that the foreign market reaches chiefly for that which must be sold below our prices, for that which is "gilt-edged."

Although this is a fruitful theme, there must be an end to this talk; and so, to cut it short, I will say you must be intelligent to see and fully comprehend all the inducements involved in the dairy business, and you must have good habits to care for the stock, the perseverance of the saints, an unbending faith in the cow, and scrupulous cleanliness in manipulating her product, and to avail yourselves of its advantages and reap its golden rewards.

Mr. Clement — We are anxious about the question of over production.

Mr. Curtis — There is no fear of over production for a good many years ahead.

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REPORT OF COMMITTEE ON DAIRY PRODUCTS.

Your committee wish to report through their chairman, that the exhibit is remarkable for its smallness, yet they were appointed and have discharged their duty, and believing that these conventions are sort of schools of instruction, we thought we would give, what in the opinion of the committee, might be improved upon the products exhibited.

In the first place I will take up the article of cheese, there are two samples. One of them is unexceptionally good. The other is the kind of cheese which would perhaps sell quicker in this market than the other. It took the first premium because it had as fine a flavor as the other, it had keeping qualities that the other lacked; aside from that, one would sell on the market for the same money as the other.

As far as the butter is concerned, there was but one sample of butter. It was made by a creamery and shows fine work; is well manufactured, but if the commission man has not notified the manufacturer that it is off color, the committee wish to do so now.

The selling qualities would be improved if it was colored, and so with the sample roll of butter, and granulated butter. The committee commend the lady who had the courage to bring the sample here, there is but one of each kind, and in consideration of that they have awarded her the premium. She has got $8—$5 on the granulated butter and $3 on the two little rolls. It showed she had an interest here, but in the opinion of the committee that product could be largely improved upon. It has taken on odors from surrounding objects, and particularly, there is no color to it, and so with the sample of granulated butter; it was simply as it should be when the salt was put in the churn, but it shows it had been churned in a granulated state. It is a fact that a large number of farmers' wives never see any butter color, and do not understand its value..

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CLASS I.

TUB OR PAIL OF BUTTER.

First Premium..... ..... $10.00
Awarded to Arcadia Creamery Co., Arcadia, Trempealeau Co.

CLASS II.

PRINT BUTTER.

First Premium..... ..... $5.00
Awarded to Mrs. J. Rhodes, Caledonia.

CLASS III.

GRANULATED BUTTER.

First Premium $3.00
Awarded to Mrs. J. Rhodes, Caledonia.

CLASS IV.

PREMIUM ON CHEESE.

Geo. S. Hart & Co's Silver Cup.

Awarded to H. Z. Fish, Richland Center.

This cup must be won three years in succession to hold the same permanently.

It has been won by A. H. Wheaton, Auroraville, 1878; Olin & Clinton, Waukesha, 1879; W. S. Baker, Cold Spring, 1880; H. A. Congor & Son, Whitewater, 1881; August Klessing, Centerville, 1882; Marr & Dyer, Whitewater, 1883; E. P. Ingalls, Milford, 1884 and H. Z. Fish, Richland Center, 1885.

Respectfully submitted,
G. A. AUSTIN,
Chairman.

President Morrison — A gentleman will stand at the door and hand to every person that wants it, a small bottle of butter color which you can try.

Mr. Hoard — I want to say a word about butter color. The grand sweep stakes prize was awarded to Mr. W. H. Potter,

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of La Soeur, Minnesota, at New Orleans. There was a sharp contest, it had narrowed down to these two men and the committee worked long and laboriously at it. There are lots of men who think there is nothing in color, but when those two samples were brought up in two separate tryers, the sample opposed to the Minnesota sample was found to be *three points off* in color and it lost tne manufacturer the grand sweepstakes prize of $150 and the gold medal on account of it. That illustrates the value of good coloring in butter. At Sparta, the landlord put some butter on the table that was as white as lard and when I asked him about it he said, "Ah! you don't catch me having colored butter on my table." I didn't ask him why his wife colored her stockings.

Question — Does the color in the butter make any difference in the flavor?

Mr. Hoard — No sir, if it is good color and well handled.

Question — What is the benefit of color any way?

Mr. Hoard — It is for the purpose of adding to the value of it.

Mr. Gorton — What does it add, any more than to the eye?

Mr. Hoard — Very well, but when you go into the market your uncolored butter will sell from five to ten cents a pound less. Isn't that practical? It does make it more presentable to the eye.

Mr. Gorton — There are men in this audience who believe, and with cause, I think, that much of the butter color is made out of grease that they would not use in the house for any purpose. There are ladies here, who would tell you they could taste it in the butter.

Mr. Hoard — I think they have got sharper taste than I have then, and I have always counted myself an extra good taster.

The President — Don't you think there is a good deal of imagination about that?

Mr. Hoard — That idea loses hundreds and thousands of dollars to the butter makers of the country, in their refusal to put their butter on the market in marketable shape. In

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deciding about the butter at New Orleans one hundred points was adopted for the grading of butter: so many points for flavor, so many for grain, so many for color; and that man lost $150 and a gold medal because he had not colored his butter to the standard which is accepted among all markets in the United States — that is June color.

Mr. Gorton — Don't you have to color your butter according to the market to which you send it?

Mr. Hoard — No, sir; I don't know of any market that wants white butter. It may be, there is a slight difference in the shade, but June color is marketable in all markets the world over.

Mr. Austin — What are we making butter for? If we are making it for ourselves, let us make it to please ourselves; if we are making it to sell, give them color if they want it and will pay for it.

THE WORLD'S EXPOSITION AT NEW ORLEANS; WISCONSIN'S DAIRY EXHIBIT THERE AND THE LESSON IT TEACHES.

By Hon. HIRAM SMITH, Sheboygan Falls.

It is no exaggeration to say that the World's Exposition at New Orleans, during the past winter, was the largest and most perfected exhibition of educational facilities, industrial resources, agricultural productions, mineral deposits, extent and variety of timber, labor saving machinery, useful implements and fruit and flowers from every clime, the vast extent of objects of use and beauty, demonstrating the genius and handi-work of men and women, far beyond anything of which the world has hitherto had any record.

And yet this grand aggregation of the tangible evidences of the World's progress, has been unjustly criticized by the ever-ready croaker, the bigoted politician, and the parsimonious nobodies to an extent that has seriously crippled the Exposition and lessened the benefits that otherwise would have been obtained.

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How best to accomplish the proper assimilation of food in the human stomach is the highest development of medical skill, and to accomplish the same purpose for the animal creation is the unsolved problem, that is, to determine the profit or loss in the rearing and care of domestic animals. The inauguration of wise measures, that effectively secure the assimilation of the people of the nation or of the world, is an evidence of the highest type of statesmanship, and constitutes the germ, out of which, may grow the broadest philanthrophy.

Without stopping to discuss the question, whether or not these high motives constitute the ruling influences that resulted in the inauguration of the World's Exposition at New Orleans, yet, the consequences resulting from that exposition, cannot fail of conferring lasting benefits on all those attended. It has been said that the exposition has been a financial failure. Grant if you will, that such has been the fact; yet, of all the failures that might have occurred, the financial embarrassment was of the least consequence. Suppose for a moment, that all the great and wonderful machinery that created "light and motion" had been missing, or the endless variety of agricultural productions remained at home, or any other of the great industries that contribute to the progress and happiness of mankind, had been left out, the failure would have been almost disastrous, and well nigh beyond remedy. But a financial difficulty, occasioned mainly by non-attendance, could be, and was, promptly removed by an act of congress, granting additional aid, and the great exhibition moved steadily on. The board of management evidently had broad and comprehensive views, and seemed to understand clearly the requirements essential to make this exhibition the best educator of modern times, for no important industry was neglected. It was, essentially, a true representation of all the industries that employ labor, reward genius, and enrich a nation.

Its management was the first World's Fair that ever fully comprehended the magnitude and importance of the dairy interests, and its liberal offer of over $10,000 in prizes for dairy products, and dairy stock, created a commendable

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rivalry among the most intelligent dairymen of the country, and more car loads of butter and cheese were on exhibition than at any former Dairy Fair ever held in this country.

The officers of the Wisconsin Dairy Association early recognized the vast importance and deep significance amounting almost to a necessity, that Wisconsin dairy products should be placed as near the front as possible. The necessity of making an exhibit of dairy products at New Orleans, became more apparent, in view of the fact of the rapid increase of dairy supplies in Canada, and throughout the great northwest, and without a corresponding increase of consumers, the producers of dairy products would, in the near future, have to call a halt. Avenues of trade, like railroads, will not open themselves, but both require human aid.

The promising field tributary to the trade of New Orleans, embracing the whole southern tier of states, the domain of Mexico, and the South American republics, all rich in possibilities of being large consumers of dairy products, with but few natural advantages to become producers —all this vast country is rich in fertilizing deposits for the northern grain farmer. Cotton seed meal for the dairyman; early vegetables and tropical fruit for all, so that an interchange of commodities is only waiting for facilities, that enterprise or greed of grain will soon discover. While in New Orleans in January last, I told the lady where I boarded that I would like to give her a pound of cheese for a pound of lettuce, or radishes, and a pound of butter for one dozen oranges, and she answered that she would be glad to give all three for a pound of butter. Transportation is practical where return freight can be obtained. In the light of the foregoing facts the officers of Wisconsin Dairy Association, aided by Commissioner Holton and J. M. Smith, decided to make the best exhibit possible, and through many discouraging circumstances, the expenditure of much personal labor and a liberal advance of money their efforts were crowned with a success far beyond their most sanguine expectations, as the following awards will show: Out of 153 prizes awarded on butter and cheese, Wisconsin obtained 82 prizes, including the two largest prizes on best show of cheese, of $300, and $200, and

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3d best show of butter, $100. Out of a total of $7,596 awarded on butter and cheese, Wisconsin obtained $3,372, a sum greater than any other two states.

In addition to the successful termination of the competitive exhibit, an acquaintance was formed by many of the producers with the largest dealers of dairy products in the city of New Orleans, that give reasonable expectations, that our trade may be largely increased in that city in the future.

President Morrison — The convention will now adjourn to 6 o'clock this evening that the hall may be prepared for the banquet gotten up by the ladies of Arcadia. There will be music, toasts and responses, and the best session of the convention will be this evening's session. Let no one stay away.

The convention will meet to-morrow morning at 9:30.

BANQUET — EVENING SESSION.

Reception by the citizens of Arcadia given the Wisconsin Dairymen's association at Muir's hall, Wednesday evening, February 25th, 1885.

Toasts.

Supper — 6 P. M.

Toast Master — S. Richmond.

1. Music.
2. Our Guests — Response by Rev. T. Grafton Owen.
3. Our Hosts, "The People of Arcadia" — Response by President W. H. Morrison, Elkhorn.
4. The Cow with the Crumpled Horn — Response by Hon. A. A. Arnold, Galesville.
5. Music.
6. The Milkmaid. "She never fails to respond to the call 'To Arms.'" — Response by C. R. Beach, Whitewater.
7. The Farmer's Legal Status with Reference to Railroads and Inventors — Response by E. C. Higbee, Arcadia.
8. The Coming Farmer. "Book Learning vs. Muscle." — Response by Prof. W. A. Henry.
9. Music.

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10. Pioneer Dairying — Response by Hon. Hiram Smith, Sheboygan Falls.
11. Wisconsin Cheese. "It is Mitey, and hath Prevailed" — Response by T. D. Curtis, Syracuse, New York.
12. The Town Pump. "Its use in the Dairy" — Response by D. L. Camp, Whitehall.
13. Music.
14. Butterine. "The Illegitimate Competitor of Honest Dairying" — Response by Stephen Favill, Delavan.
15. The Dairyman. "A Calling of Noble History, Wholesome Sentiment, and Useful Achievement" — Response by W. D. Hoard, Fort Atkinson.
16. How is it Down South. Response by D. W. Curtis, Fort Atkinson; Wisconsin Commissioner to New Orleans Exposition.
17. Music.
18. Our Legislature. "One of the Necessary Evils of Modern Civilization" — Response by Hon. Chester Hazen, Brandon, Member of Legislature.

Six hundred sat down to the banquet, that was good enough to "set before a king." Good music was interspersed with the speeches, and, thanks to the excellent management, there were no hitches of any kind, so that the evening passed off in the pleasantest manner possible, and to the great enjoyment of all present.

MORNING SESSION, February 26, 1885.

Met pursuant to adjournment at 9:30 A. M.

President Morrison in the chair.

REPORT OF COMMITTEE ON NOMINATIONS.

Your committee appointed to select names for officers for the Wisconsin Dairymen's Association for the ensuing year, beg leave to submit the following:

For President—W. H. Morrison, Elkhorn.
For Secretary—D. W. Curtis, Fort Atkinson.
For Treasurer—H. K. Loomis, Sheboygan Falls.

Respectfully submitted.

S. FAVILL,
W. D. HOARD,
F. B. FARGO,
Committee.

Report of committee was adopted.

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TREASURER'S REPORT.

Mr. President and Members of the Association:

The following itemized report is made, showing the source from which all moneys paid into the treasurer's hands were received, and the disbursements paid on orders from the secretary, which I hold as vouchers:

RECEIPTS.

Jan. 1, 1884.	Cash on hand	$393 14
Jan. 18, 1884.	Memberships, Lake Mills	143 00
Jan. 18, 1884.	Entries received from dairy exhibitors	25 50
Mar. 27, 1884.	Received from state treasurer	500 00
Sept. 2, 1884.	Received from Commissioner E. D. Holton, for New Orleans Exposition	500 00
Oct. 10, 1884.	Received from Commissioner E. D. Holton, amount raised by Hiram Smith and De Land	200 00
Jan. 1, 1885.	Rec'd from state treasurer, raised by D. W. Curtis.	140 00
Jan. 1, 1885.	Rec'd from state treasurer, raised by A. J. Decker.	80 00
Jan. 9, 1885.	Rec'd from state treas., raised by W. H. Morrison.	130 00
Feb'y. 1885.	Rec'd from Com'r E. D. Holton, raised by H. Z. Fish	100 00
	Total receipts	$2,211 64

NOTE.—The money raised by Smith and De Land, Curtis, Decker, Morrison and Fish, was for expenses in making Dairy Exhibit at New Orleans.

DISBURSEMENTS.

1883.		
Jan. 18.	W. D. Hoard's printing bill	$27.50
	Paid J. B. Harris to attend annual meeting	100.00
	Paid J. B. Harris, hotel bill	8.00
	Paid Mrs. Kelley, short-hand reporter	44.00
	Paid hotel bill Mrs. Kelley	5.00
	Paid hotel bill Prof. Henry	1.50
	Paid T. D. Curtis, essay on cheese-making	15.00
	Paid D. W. Curtis, essay on butter-making	15.00
	Paid hotel bill T. D. Curtis	50

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Jan. 20.	D. W. Curtis, for secretary's office	$20.00
	C. P. Goodrich, 2d premium on butter	3.00
	Harris Bros., 2d premium on butter	2.00
	H. Z. Fish, 2d premium on cheese	5.00
	Marr & Dyer, first premium on butter	3.00
	H. W. Kellogg, 2d premium on butter	5.00
	H. W. Kellogg, 1st premium on butter	5.00
	Wm. Everson, 1st premium on butter	10.00
	E. P. Ingalls, 1st premium on butter	10.00
	H. Wrightson, essay on cheese-making	5.00
Mar. 15.	Exchange on drafts	10.00
11.	Reading proof of report, by Democrat Printing Co	10.00
22.	Letter heads of Gugler Lithographing Co	9.00
24.	Use of room at Plankinton House for executive committee	75
25.	Salary of secretary, D. W. Curtis	75.00
June 2.	Express on reports and stationery	1.45
July 24.	Democrat Printing Co., extra pages of the report	25.40
25.	Postage	74
Aug. 5.	T. D. Curtis, for work as instructor in cheese factories	225.00
Oct. 16.	Use of room at Plankinton House for. Ex. Com	3.00
Nov. 6.	D. W. Curtis, for stamps to send premium list and circulars for New Orleans Exposition	50.00
	Exchange on drafts	1.60
Dec. 27.	Paid A. De Land for exposition at N. O	358.38
	Paid for 451 lbs. cheddar cheese for N. O. Ex	54.12
	Paid for 254 lbs. flat cheese for N. O. Ex	30.48
	Paid for 152 lbs. Young America cheese	18.24
30.	W. D. Hoard's printing bill. N. O. Ex	30.50

1885.

Jan. 1.	Express on medals for N. O. Ex	45
2.	Collecting medals, H. K. Loomis, for N. O. Ex	6.00
	D. W. Curtis, for N. O. Ex	500.00
	Paid bill of H. Z. Fish, collecting cheese for N. O. Ex	38.79
3.	Paid sight draft, D. W. Curtis, New Orleans	150.00
	Paid D. W. Curtis, by Com'r. E. D. Holton, at N. O	100.00
	Hiram Smith, meeting with Ex. Com., 1884-5	20.00
	C. R. Beach, meeting with Ex. Com., 1884-5	15.00
	Chester Hazen, meeting with Ex. Com., 1884-5	10.00
	Stephen Favill, meeting with Ex. Com., 1884-5	15.00
	W. H. Morrison, meeting with Ex. Com., 1884-5	15.00
	A. D. De Land, meeting with Ex. Com., 1884-5	10.00
	W. D. Hoard, meeting with Ex. Com., 1884-5	20.00

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D. W. Curtis, meeting with Ex. Com., 1884–5	20.00
H. K. Loomis, meeting with Ex. Com., 1884–5	20.00
Balance in hands of treasurer	91.74
	$2.211,64

Respectfully submitted,

H. K. LOOMIS,

Treasurer.

SECRETARY'S REPORT.

Mr. President—The past year has been one of interest to this association, and the labor it has performed and the good it has accomplished, will compare favorably with any association of a like nature, in any part of the country.

At a meeting of the executive committee some time in April, it was decided to employ T. D. Curtis, of Syracuse, N. Y., if the money in the treasury of the association should be found sufficient. Mr. Curtis generously offered to go to work, leaving it to the executive committee to pay him whatever they could.

The railroads furnished free transportation to Mr. Curtis, which lessened traveling expenses, and enabled the society to continue the work much longer than it could otherwise have done had this favor not been granted.

The following circular letter was sent to all of the dairy boards of trade in the state, which explains the work outlined by the executive committee for Mr. Curtis.

WISCONSIN DAIRYMEN'S ASSOCIATION,
FORT ATKINSON, WIS., May 20, 1884.

DEAR SIR—The Executive Committee of the Wisconsin Dairymen's Association, have decided to employ T. D. Curtis, of Syracuse, N. Y., for the purpose of instructing the cheese makers of Wisconsin how to make a better article of cheese.

He will visit your Dairy Board of Trade, should you wish to have him, and talk on cheese making, and the next day will visit some factory and give practical lessons to cheese makers, in making cheese. He will visit as many factories as he can in your vicinity. The only expense you will be to, is to take care of him, while with you. We trust that he will get to work some time in June.

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An early reply is requested, that the dates may be fixed when he will be at your place.

Yours truly,

D. W. CURTIS,
Secretary.

Mr. Curtis went to work about the 10th of June, working until the 1st of September, visiting all parts of the state, wherever requested. His stay at each factory was necessarily short, but enough was demonstrated to the cheese-makers, to awaken a new interest and a determined effort on their part to make a better article of cheese. That there was good work done which was of great value to the state there is no question.

The work is almost too much for one man to undertake; his stay is too short at each factory, the cheese-maker hardly having time to unlearn some of the errors which he had fallen into. The state should be divided into districts, with an instructor in each district. The general results would be much better. There are too many careless cheese-makers who are anxious to get through their day's work that they may have a ride (as a large number keep a horse and buggy), and all at the expense of the patrons. Cleanliness and faithful labor should be a badge every cheese-maker should wear.

About the first of August the Executive Committee met to determine upon a plan of work to secure an exhibit of butter and cheese at the world's exposition at New Orleans under the state commissioner, Hon. E. D. Holton. At a subsequent meeting of the executive committee which was largely attended by prominent dairymen from all parts of the state, D. W. Curtis, of Fort Atkinson was appointed superintendent of dairy products, and Hon. A. D. DeLand, of Sheboygan, takes assistant superintendent.

The following committees were appointed to canvass their own sections for butter and cheese to be exhibited at New Orleans and to solicit funds to defray the expenses, Governor Rusk promising to do all he could to have the money that was raised refunded by the state when the legislature met.

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The committee consisted of:

W. H. Morrison, Elkhorn.
D. W. Curtis, Fort Atkinson.
H. Z. Fish, Richland Center.
A. D. DeLand, Sheboygan Falls.
A. J. Decker, Fond du Lac.
R. F. Roberts, Woodworth.
W. D. Breed.
Fred Shultie, Manitowoc.
John Luchsinger, Monroe.

The following sums were received and turned over to Commissioner Holton, and have been paid back by the state.

Hon. Hiram Smith and A. D. De Land, from the Dairy Board of Trade, Sheboygan Falls,	$200 00
D. W. Curtis, Jefferson county,	140 00
W. H. Morrison, Walworth county,	130 00
H. Z. Fish, Richland county,	100 00
A. J. Decker, Fond du Lac county,	80 00

Commissioner Holton gave the association $500 from the $5,000 which was allowed him, and with this money the exhibit was made at the World's Fair at New Orleans, and the shortage was paid out of the funds of the association.

The following tables will show who were the exhibitors, who won premiums, and the amounts won by each:

In this connection it may be proper to state, that there were two judges and an umpire, and the umpire was called upon to decide, where there was a tie.

The following was the

SCALE OF POINTS FOR JUDGING BUTTER.

Flavor,	40
Grain,	30
Color,	15
Saltir g,	10
Style of Package,	5
Total,	100

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The following table shows the entries in Lot A, Class 1, Creamery Butter, made previous to September 1st. Best five tubs of not less than 50 pounds each. 1st premium, $100; second premium, $75; 3d premium, $50; and the award of the judges, C. F. Dexter, Chicago, and C. E. Udell, St. Louis (same judges in class 1, 2 and 3).

NAME OF EXHIBITOR.	Flavor.	Grain.	Color.	Salting.	Style of package.	Total.	Grand Total.	First premium.	Second premium.	Third premium.
H. K. Loomis	35	27	14	7	4	87				
	32	26	12	7	4	81	168			
G. C. Mansfield	37	30	14	9	4	94				
	36	28	13	9	4	90	184			$50
CLASS 2—SEPTEMBER AND OCTOBER CREAMERY BUTTER.										
Cooper & Neville	37	28	13	10	5	93				
	37	28	14	10	4	93	186			
G. C. Mansfield	38	29	14	9	5	95				
	38	29	14	10	5	96	191			
John Brown	35	28	12	8	4	87				
	36	27	13	8	4	88	175			
Harris Bros	36	26	12	7	5	86				
	36	27	13	8	4	88	174			
A. L. Snyder	32	25	9	8	3	77				
	34	26	13	8	4	85	162			
Alma Creamery Co	34	26	9	7	5	81				
	34	28	11	7	5	85	166			
CLASS 3—NOVEMBER AND DECEMBER CREAMERY BUTTER.										
Cooper & Newell	37	27	14	8	5	91				
	37	28	14	10	5	94	185			
G. C. Mansfield	36	29	13	9	5	92				
	30	30	14	10	5	89	181			
J. M. Thomas	33	25	11	7	5	81				
	33	25	12	9	5	84	165			
Harris Bros	37	27	12	7	5	88				
	36	27	13	9	5	90	178			
A. L. Snyder	34	24	12	7	4	81				
	35	26	12	8	5	86	167			
Alma Creamery Co	30	25	8	7	5	75				
	35	27	10	9	5	86	161			
Millard & Everson	34	25	6	6	4	75				
	32	22	8	8	4	74	149			

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The following table shows the entries in Lot B, Class 1—dairy butter, made previous to September 1st. Best tub of butter of not less than 40 lbs, 1st premium, $75; 2d premium. $50; 3d premium, $25, and the award of the judges, G. W, Simpson, Boston; C. A Huston, Cedar Rapids, Iowa; E. B. Jennings, umpire, New Orleans. Class 1, 2 and 3.

NAME OF EXHIBITOR.	Flavor.	Grain.	Color.	Salting.	Style of package.	Total.	Grand total.	First premium.	Second premium.	Third premium.
Wm. McConnell	35	30	15	10	5	95	....	....	....	....
	37	30	15	10	5	95	190	....	$50	...
Hiram Smith	33	30	15	10	5	93	....	....	....	....
	37	30	15	9	5	96	187	....	....	$25
CLASS 2. SEPT. AND OCT. DAIRY BUTTER—										
Hiram Smith	30	28	14	8	5	85	....	....	....	....
	30	28	12	8	5	83	168	....	....	....
Wm. McConnell	33	30	15	10	5	93	....	....	....	....
	35	30	15	8	5	93	186	....	....	....
J. T. Scott	34	30	15	10	5	94	....	....	....	....
	36	25	14	10	5	90	184	....	....	....
CLASS 3. NOV. AND DEC. DAIRY BUTTER.—										
H. W. Kellogg	30	20	14	10	5	79	....	....	....	....
	35	25	13	10	5	88	167	...	....	...
J. T. Scott	28	30	14	10	5	87	....	....	....	....
	35	30	15	9	5	94	....	....	....	....
Wm. McConnell	33	30	15	8	5	91	....	....	....	....
	32	30	15	8	5	90	181	....	....	....
N. W. Morley	35	30	13	10	5	93	....	....	....	....
	35	30	12	8	5	90	183	....	....	....
Hiram Smith	34	30	14	10	5	93	....	....	....	....
	36	36	13	10	5	94	187	....	....	...
J. G. Flack	37	30	14	10	5	96	....	....	....	....
	38	30	14	10	5	97	193	....	....	$25
L. Perrott	30	30	15	10	5	90	....	....	....	...
	32	28	13	10	5	88	178	....	....	....

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The following table shows the entries in Lot C, pro rata premium of $1,000, and the award of the judges, Samuel B. Davis, Chicago; and E. B. Jennings, New Orleans. Best tub of butter of not less than 50 lbs., made at any time or place, or by any process. The total of the above premium to be divided among the exhibitors in proportion to the number of points obtained by each entry which shall be awarded 85 points or over, in a scale of 100.

NAME OF EXHIBITOR.	Flavor.	Grain.	Color.	Salting.	Style of package.	Total.	Grand total.	Pro rata premium.
F. E. Carswell	27	22	13	8	5	75	....	.....
	30	22	13	9	4	76	151	.....
Cooper & McNewell	21	15	8	5	4	53	....	.....
	20	13	8	5	3	51	104	.....
H. K. Loomis	35	25	13	8	4	85	....	.....
	36	25	11	8	5	85	170	.....
G. C. Mansfield	26	22	10	7	3	68	....	.....
	26	23	10	9	4	71	139	.....
J. M. Thomas	36	28	13	8	3	88	....	.....
	38	28	14	8	4	93	181	.....
Solon Brown	28	20	12	7	3	70	....	.....
	29	26	10	8	3	76	146	....
Harris Bros	34	20	11	8	4	77	....	.....
	35	20	7	8	4	74	151	.....
N. W. Morley	29	20	10	7	3	69	....	.....
	23	20	10	7	3	63	132	.....
Wm. McConnell	28	20	12	6	1	67	....	.....
	28	23	10	7	1	65	132	.....
Millard & Everson	20	18	8	8	1	55	....	.....
	20	20	10	8	1	59	114	.....
J. T. Scott	24	25	13	7	2	71	....	.....
	24	24	18	7	4	71	142	.....
A. L. Snyder	29	20	10	5	3	67	....	.....
	28	25	10	7	3	73	140	.....
Alma Creamery Co	22	20	10	7	4	63	....	.....
	20	15	10	7	3	55	118	.....
W. S. Greene	28	22	10	8	4	72	....	.....
	35	25	8	8	4	80	152	.....
W. S. Roach	22	15	8	6	4	55	....	.....
	20	18	10	8	4	60	115	.....
Hiram Smith	29	18	9	5	5	66	....	.....
	28	26	10	8	4	76	142	.....

In Lot D, Class 1, for the largest and best display of butter (quality considered), by any dairy association, dairy board of

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trade, or dairy produce exchange, if manufactured by the members thereof — 1st premium, $300; 2d premium, $200; 3d premium, $100 — the judges, C. F. Dexter, Chicago; and C. E. Udell, St. Louis, awarded the third premium to the Wisconsin Dairymen's Association.

The following table shows the entries in Lot E, Class 1. Print and ornamental butter, of not less than 10 lbs. First premium $50, 2d premium $30, 3d premium $20, and the award of the judges in classes 1, 2, 3 and 5—Samuel B. Davis, Chicago; E. B. Jennings, New Orleans:

NAME OF EXHIBITOR.	Flavor.	Grain.	Color.	Salting.	Style of package.	Total.	Grand total.	First premium.	Second premium.	Third premium.
G. C. Mansfield	34	20	12	9	2	77	....	....	....	....
	32	25	13	8	2	80	157	....	....	....
H. W. Kellogg	30	15	2	8	0	61	....	....	....	....
	28	20	10	7	0	75	126	....	....	....
CLASS 2.—ROLL BUTTER.										
G. C. Mansfield	30	21	12	8	3	74	....	....	....	....
	30	23	14	7	3	77	151	$50	....	....
H. W. Kellogg	29	20	12	9	1	71	....	....	....	....
	30	20	11	8	2	71	142	....	$30	....
CLASS 3.—GRANULATED BUTTER.										
Cooper & Newell	32	25	13	9	4	83	....	....	....	....
	30	25	14	9	4	82	165	....	....	....
Wis. Dairymen's Association	33	24	13	8	4	82	....	....	....	....
	31	26	14	7	4	82	164	....	....	....
Harris Bros.	30	20	12	8	4	74	....	....	....	....
	32	20	12	8	3	75	149	....	....	....
A. L. Snyder	25	15	12	8	4	64	....	....	....	....
	25	15	11	7	3	61	125	....	....	....
Wm. McConnell	32	20	10	8	4	74	....	....	....	....
	30	16	14	8	3	72	146	....	....	....
CLASS 5.—BUTTER PACKED FOR WARM CLIMATES.										
G. C. Mansfield	35	24	12	9	4	84	....	....	....	....
	32	23	13	8	4	80	164	....	$50	....

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The following table shows the entries in Lot F, Class 3, for the best tub of butter of not less than 50 lbs., made at any time, in the states of Ohio, Illinois, Indiana, Missouri Wisconsin, Michigan, Iowa, Minnesota, Kansas, Nebraska, California, Oregon, Nevada, Colorado, and all of the territories. 1st premium, $75; 2d premium, $50; 3d premium, $25; and the award of the judges, Sam'l B. Davis, Chicago, and E. B. Jennings, New Orleans:

NAME OF EXHIBITOR.	Flavor.	Grain.	Color.	Salting.	Style of package.	Total.	Grand total.	First premium.	Second premium.	Third premium.
Cooper & Newell	28	25	12	9	5	79	....	....	....	....
	30	22	13	8	4	77	156	....	....	....
G. C. Mansfield	26	25	9	8	4	73	....	....	....	....
	30	23	12	7	4	76	149	....	....	....
J. M. Thomas	28	25	12	8	4	77	....	....	....	....
	30	20	12	8	3	73	150	....	....	....
H. W. Kellogg	28	18	8	8	5	61	....	....	....	....
	26	18	10	7	3	64	125	....	....	....
Hiram Smith	32	25	8	8	4	77	....	....	....	....
	34	22	10	7	4	77	154	....	....	....
Harris Bros	27	20	10	8	5	70	....	....	....	....
	30	22	12	8	4	76	146	....	....	....
N. W. Morley	36	28	14	9	5	92	....	....	....	....
	32	28	12	10	5	87	179	....	....	....
Millard & Everson	25	27	13	9	2	74	....	....	....	....
	28	24	10	8	1	71	145	....	....	....
J. C. Scott	36	24	13	8	4	75	....	....	....	....
	30	22	13	7	4	76	151	....	....	....
Alma Creamery Co.	30	25	9	7	4	76	....	....	....	....
	30	20	10	8	5	73	149	....	....	....

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PREMIUMS ON CHEESE.

SCALE OF POINTS FOR JUDGING.

Flavor	30
Quality	30
Texture	20
Color	10
Salting	10
Total	100

The following table shows the entries in lot G, class 1, best five boxes cheese (cheddar shaped) of not less than 250 pounds, made in June. 1st premium, $100; 2d premium, $75; 3d premium, $50; and the award of the judges, S. B. Davis, Chicago; C. E. Udell, St. Louis; E. B. Jennings, umpire, New Orleans (same judges in classes 1, 2, 3, 4 and 6):

NAME OF EXHIBITOR.	Flavor.	Quality.	Texture.	Color.	Salting.	Total.	Grand total.	First premium.	Second premium.	Third premium.
H. Z. Fish	28	25	18	8	8	82	....	....	....	....
	22	22	15	6	8	73	155	$100	....	....

The following table shows the entries in Lot G, Class 2. Best five boxes cheese (cheddar shape) of not less than 250 lbs., made at any time or place. First premium $100, 2d premium $75, 3rd premium $50, and the award of the judges:

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NAME OF EXHIBITOR.	Flavor.	Quality.	Texture.	Color.	Salting.	Total.	Grand Total.	First premium.	Second premium.	Third premium.
Cold Spring cheese, White-water	22	25	14	8	9	78	....	....	....	....
	22	25	15	8	8	81	159	....	....	....
Chester Hazen, Brandon....	27	25	18	9	10	89	....	....	....	....
	25	28	18	8	9	88	177	....	....	....
Clark & Reynolds, Hebron..	18	19	18	7	8	70	....	....	....	....
	18	20	18	8	8	72	142	....	....	....
N. J. Hooker, Lake Mills....	20	20	18	6	9	73	....	....	....	....
	15	25	18	7	8	73	146	....	....	....
Aztalan Cheese Co, Aztalan	15	20	10	5	9	59	....	....	....	....
	15	20	10	8	8	61	120	....	....	....
H. Z. Fish, Richland Center.	29	29	20	7	10	95	....	....	....	....
	28	28	20	7	10	93	188	$100	....	....
E. P. Ingalls, Milford.....	15	23	10	6	8	62	....	....	....	....
	15	15	10	7	8	55	117	....	....	....
M. N. Seward, Harvey.....	25	23	15	8	9	80	....	....	....	....
	20	20	15	8	7	70	150	....	....	....
Olin Crossfield & Co., Fort Atkinson.....	15	20	17	8	8	68	....	....	....	....
	18	20	18	8	8	72	140	....	....	....
J. L. R. McCullom.....	12	20	18	8	8	66	....	....	....	....
	10	20	18	8	8	64	130	....	....	....
C. B. McCanna, Springfield..	27	25	18	9	8	87	....	....	....	....
	20	20	18	8	8	74	161	....	....	....
E. B. Fargo, Lake Mills.....	27	26	17	9	9	88	....	....	....	....
	25	22	15	8	8	78	166	....	....	....
C. W. Davis, Ithaca..... ...	20	15	10	6	8	59	....	....	....	....
	20	18	12	8	7	65	124	....	....	....
V. West.....	12	20	14	6	8	60	....	....	....	....
	15	18	18	8	6	65	125	....	....	....
F. Luchsinger	10	15	12	5	6	48	....	....	....	....
	10	15	10	6	6	47	95	....	....	....
H. Z. Fish	16	10	15	6	7	54	....	....	....	...
	12	12	10	6	6	46	100	....	....	....
Otto Friend	25	20	13	7	8	73	....	....	....	....
	25	20	15	8	8	76	149	....	....	....
L. Perrott	25	25	15	10	9	84	....	....	....	....
	25	25	15	10	9	84	168	....	....	....
F. E. Carswell.....	20	25	19	7	8	84	....	....	....	....
	25	25	15	8	8	81	165	....	....	....
H. K. Loomis	28	29	18	9	10	94	....	....	....	....
	28	28	18	9	8	91	185	....	$75	....
G. C. Mansfield.....	10	15	10	6	6	47	....	....	....	....
	10	10	5	5	5	35	82	....	....	....
F. E. Carswell.....	20	25	14	7	7	73	....	....	....	....
	20	18	18	7	8	71	144	....	....	....
H. Z. Fish.....	15	25	17	8	8	73	....	....	....	....
	15	24	18	8	8	73	146	....	....	....
Chester Hazen	28	27	18	9	9	91	....	....	....	....
	28	28	18	9	9	92	183	....	....	....

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The following table shows the entries in Lot G, Class 3.—Best five boxes flat cheese, of not less than 140 lbs., made in June. 1st premium, $100; 2d premium, $75; 3d premium, $50, and the award of the judges:

NAME OF EXHIBTIOR.	Flavor.	Quality.	Texture.	Color.	Salting	Total.	Grand total.	First premium.	Second premium.	Third premium.
B. Holden	25	25	10	5	8	75	....	....	....	....
	20	20	15	8	8	71	146	....	$75	....
A. D. DeLand	27	27	17	9	9	89	....	....	....	....
	26	25	20	8	8	86	175	$100	....	....

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The following table shows the entries in Lot G, Class 4. Best five boxes flat cheese, of not less than 140 lbs, mads at any time or place. 1st premium, $100; 2d premium, $75; 3d premium, $50; and the award of the judges:

NAME OF EXHIBITOR.	Flavor.	Quality.	Texture.	Color.	Salting.	Total.	Grand total.	First premium.	Second premium.	Third premium.
Clark & Reynolds	18	15	10	8	7	58	....	....	....	....
	15	15	10	8	7	55	113	....	....	....
Aztalan Cheese Company	15	15	10	7	6	53	....	....	....	....
	15	18	10	6	6	52	105	....	....	....
H. Z. Fish	28	25	19	8	9	89	....	....	....	....
	26	26	18	9	9	88	177	....	$75	....
H. Z. Fish	22	20	18	8	8	76	....	....	....	....
	20	15	15	8	8	66	142	....	....	....
M. J. Bumford	15	20	18	8	8	69	....	....	....	....
	20	20	18	8	7	73	142	....	....	....
H. H. Kuntz	28	22	15	9	8	79	....	....	....	....
	20	20	17	9	8	74	153	....	....	....
P. Perrott	23	24	14	9	8	78	....	....	....	....
	15	15	15	8	8	61	139	....	....	....
F. E. Carswell	25	25	16	8	9	83	....	....	....	....
	24	24	18	8	8	80	163	....	....	....
Cooper & Newell	15	18	10	7	6	56	....	....	....	....
	18	18	15	6	6	63	119	....	....	....
H. Strothoff	16	18	13	6	8	61	....	....	....	....
	20	20	14	8	8	70	131	....	....	....
A. D. DeLand	20	20	15	5	8	68	....	....	....	....
	28	20	15	6	8	67	135	....	....	....
H. K. Loomis	25	24	18	9	8	84	....	....	....	....
	23	24	18	8	8	81	165	....	....	$50
Wm. Vetting	28	28	17	10	9	92	....	....	....	....
	26	26	19	9	9	89	181	$100	....	....
G. C. Mansfield	15	18	10	6	6	55	....	....	....	....
	15	15	10	7	6	53	108	....	....	....
J. M. Thomas	20	22	15	7	6	70	....	....	....	....
	18	18	15	7	7	65	135	....	....	....
Gartman & Etreren	16	20	12	7	7	62	....	....	....	....
	20	20	18	7	8	73	135	....	....	....

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The following table shows the entries in Lot G, Class 6. Best five boxes of four in a box, Young America cheese, made at any time or place, 1st premium, $100; 2d premium, $75; 3d premium, $50; and the award of the judges.

NAME OF EXHIBITOR.	Flavor.	Quality.	Texture.	Color.	Salting.	Total.	Grand total.	First premium.	Second premium.	Third premium.
Chas. A. Bahr, Manitowoc..	26	25	15	7	8	81	....	....	....	....
	25	25	20	8	8	86	167	....	$75	....
Clark & Reynolds, Hebron..	25	22	12	7	8	74	....	....	....	....
	25	23	18	8	8	82	156	....	....	$50
H. K. Loomis, Sheboygan	28	28	19	9	9	94	....	....	....	....
Falls.....	29	27	20	8	8	91	185	$100	....	....

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The following tables show the entries in Lot H, and the award of the judges, C. F. Dexter, Chicago, and G. W. Simpson, Boston, for pro rata premium of $1,000, to be given for best box of cheese, made at any time or place; the total of the above premium to be divided among the exhibitors in proportion to the number of points obtained by each entry, whose exhibit shall beawarded 85 points or over in a scale of 100.

NAME OF EXHIBITOR.	Flavor.	Quality.	Texture.	Color.	Salting.	Total.	Grand total.	Pro rata premium.
H. Z. Fish, Richland Center	23	22	16	8	9	78	....	.....
	25	24	17	8	8	82	160	.....
T. R. Fish, Neptune	23	25	20	10	10	88	....	.....
	28	28	18	8	10	92	180	$17.45
Chas. A. Burr, Manitowoc.	18	22	17	9	10	75	....	.....
	20	23	16	8	8	75	150	.....
Aug. Woelfer, Lake Mills	27	26	19	10	10	92	....	.....
	27	28	18	10	10	93	185	17.95
Eugene Wardwell, Cambridge	23	22	18	9	10	82	....	.....
	22	23	15	10	10	80	162	.....
D. Gardner, Milford	24	26	19	9	10	88	....	.....
	27	27	19	8	10	91	179	17.36
A. D. Fish, Richland Center	26	27	27	10	10	83	....	.....
	29	29	20	10	10	98	191	18.50
Cold Spring Cheese Co., Whitewat'r	20	24	18	9	9	80	....	.. ...
	25	26	19	8	10	88	168	.....
C. Hazen, Brandon	25	26	19	9	10	89	....	.....
	26	28	19	9	10	92	181	17.55
Clark & Reynolds, Hebron	22	23	19	9	10	83	....	.....
	20	22	19	8	10	79	162	.....
F. J. Hooker, Lake Mills	24	24	19	8	10	85	....	.....
	27	28	19	8	10	92	177	17.55
Aztalan Cheese Co, Aztalan	26	25	17	9	10	87	....	.....
	26	25	18	8	9	86	173	16.80
E. P. Ingalls, Milford	23	25	19	9	10	86	....	.....
	27	26	19	8	10	90	176	17.35
M. N. Seward, Harvey	26	28	19	10	10	93	....	.....
	27	27	18	8	10	90	183	17.75
Olin, Crossfield & Co, Ft. Atkinson.	27	28	19	10	10	94	....	.....
	28	28	18	10	10	94	188	18.25
J. L. R. McCollum	22	25	20	9	10	86	....	.....
	22	23	17	8	8	78	164	.. ...
C. B. McCanna, Springfield	23	22	16	10	10	81	....	.....
	20	25	15	10	10	80	161	.....
E. B. Fargo, Lake Mills	27	28	19	10	10	94	....	.....
	27	28	18	10	10	93	187	18.15
C. W. Davis, Ithica	26	24	19	10	10	89	....	.....
	25	25	17	8	8	83	172	16.70
V. West	23	27	19	8	10	87	....	.....
	22	25	18	8	8	81	168	.....

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NAME OF EXHIBITOR.	Flavor.	Quality.	Color.	Texture.	Salting.	Total.	Grand total.	Pra rata premium.
H. Z. Fish, Richland Center	24	26	20	9	10	89	....	.....
	25	26	20	9	10	90	179	$17.35
H. J. Bumford, Plymouth	28	27	19	8	10	92	....	.....
	27	27	19	8	10	91	183	17.75
H. Widder, Hingham	27	28	19	10	10	94	....	.....
	27	27	18	8	10	90	184	17.85
M. McKennon	19	26	17	9	10	81	....	.....
	27	25	18	8	9	87	168	.....
H. Lemknil, Ostburg	24	22	18	10	10	84	....	.....
	25	26	18	8	9	86	170	16.50
G. Lammers, Cedar Grove	28	29	20	10	10	97	....	.....
	29	28	20	10	10	97	194	18.80
M. Lemwlin, Edwards	26	27	18	9	10	90	....	.....
	26	25	17	8	9	85	175	16.95
H. H. Kentz, Manitowoc	26	27	19	9	10	91	....	.....
	26	26	18	8	9	87	178	17.25
Chester Hazen, Brandon	27	26	20	9	10	92	...	.....
	26	24	19	10	10	89	181	17.55
Otto Friend	20	22	18	10	10	80	....	.....
	20	23	18	10	10	81	161	.....
H. Weiskopf, Edwards	24	25	18	10	10	87	....	.....
	24	24	17	8	10	83	170	16.50
H. Walvoord, Cedar Grove	24	25	19	10	10	88	....	.....
	23	24	18	9	9	83	171	16.60
Q. A. Danford, Meemee	27	28	20	10	10	95	....	.....
	28	28	18	10	8	92	187	18.15
Wrench Bros, Hika	23	24	20	9	10	86	....	.....
	25	26	17	7	10	85	171	16.60
Geo. Eldrige, Waldo	29	28	19	10	10	96	....	.....
	29	28	20	10	10	97	193	18.70
H. Olin, Edwards	24	26	19	10	10	89	....	.....
	25	25	18	9	10	87	176	17.05
J. Dassaw	21	24	18	10	10	83	....	.....
	23	25	17	10	9	84	167	.....
J. Friek, Plymouth	27	26	19	10	10	92	....	.....
	27	26	18	8	8	87	179	17.35
C. T. Kersted	24	25	17	10	10	86	....	.....
	24	23	18	8	9	82	168	.....
H. Habihorst	23	25	17	10	10	85	....	.....
	25	22	15	8	10	80	165	.....
F. G. Meyer, Meemee	23	24	18	9	10	84	....	.....
	24	25	18	9	10	86	170	16.50
Carl Reik, Sheboygan Falls	27	26	17	10	10	90	...	.....
	27	26	17	10	10	90	180	17.45
F. Luecke, Howard's Grove	23	25	18	10	10	86	...	.....
	26	27	18	8	10	89	175	16.95
F. A. Kilsman	24	23	16	9	10	82	....	.....
	23	22	18	9	8	80	162	.....
Milford Cheese Ass'n, Milford	21	26	19	7	10	83	....	.....
	25	24	18	9	10	86	189	17.55
Loomis & Laver, Hingham	29	28	20	10	10	97	....	.....
	30	28	19	10	10	97	194	18.80

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NAME OF EXHIBITOR.	Flavor.	Quality.	Texture.	Color.	Salting.	Total.	Grand total.	Pro rata premium.
Nick Pauley	23	24	18	9	10	84		
	20	22	18	8	9	77	161	
Wm. Fleischman, Winooska	27	27	17	9	10	90		
	25	24	17	8	9	83	173	$16.80
Carl Goldbeck, Winooska	25	28	18	9	10	90		
	26	26	18	8	10	88	178	17.25
J. C. Peck, Waldo	26	27	19	10	10	92		
	25	24	18	9	10	86	178	17.25
J. Whissellink	20	23	17	10	10	80		
	22	23	19	8	10	82	162	
A. Antone, Belgium	26	27	18	9	10	90		
	24	25	18	8	9	84	174	16.85
F. Themar	24	26	17	10	10	87		
	23	22	17	10	8	80	167	
Torry Walvord	20	22	19	10	10	81		
	22	23	18	10	10	83	164	
H. K. Rondre	20	24	18	10	10	82		
	20	22	17	8	10	77	159	
John Hartel, Meemee	24	25	18	9	10	86		
	26	25	16	8	9	84	170	16.50
F. Widder, Sheboygan Falls	28	24	20	10	10	95		
	28	28	20	10	8	94	189	18.35
C. Buscher, Ada	26	26	17	9	10	88		
	27	28	19	10	10	94	182	17.65
F. Wagenkneicht, Keil	26	27	20	10	10	93		
	28	28	19	9	10	94	187	18.15
D. Evans	20	21	17	9	10	77		
	18	20	15	5	8	66	143	
H. Z. Fish, Richland Center	27	26	20	9	10	92		
	27	27	18	8	10	90	182	17.65
L. Perrott, Greenville	22	26	16	10	10	84		
	27	26	18	9	10	90	174	16.85
F. E. Carswell, Lone Rock	26	25	19	10	10	90		
	27	25	18	10	10	90	180	17.45
Cooper & Newell, Whitewater	23	26	18	10	10	87		
	24	23	17	7	8	79	166	
W. S. Greene, Fort Atkinson	26	27	19	10	10	92		
	25	23	17	7	8	80	172	16.70
W. S. Roach, Johnson's Creek	26	27	18	9	10	90		
	27	27	19	8	10	91	181	17.55
H. Strothoff	25	26	18	6	10	85		
	25	25	17	7	8	82	167	
B. Holden, Plymouth	21	20	18	9	10	78		
	20	22	18	7	8	75	153	
A. D. DeLand, Sheboygan Falls	24	26	19	10	8	87		
	23	20	18	9	10	80	167	
H. K. Loomis, Sheboygan Falls	26	28	20	9	10	93		
	28	28	20	9	10	95	188	18.25
Wm. Betting, Manitowoc	27	25	18	10	10	90		
	26	28	20	9	10	93	183	17.85
Gartman & Ehren, Sheboygan Falls	21	27	18	10	10	86		
	25	24	18	10	10	87	173	16.80

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NAME OF EXHIBITOR.	Flavor.	Quality.	Texture.	Color.	Salting.	Total.	Grand total.	Pro rata premium.
G. C. Mansfield, Johnson Creek...	26	25	19	10	10	90	.....	.....
	23	25	17	9	9	83	173	$16.80
J. M. Thomas, Dixon.....	25	27	19	10	10	91	.....	.....
	25	26	18	8	10	87	178	17.25
F. E. Carswell, Lone Rock.....	26	27	18	10	10	91	.....	.....
	27	28	19	9	10	93	184	17.85

In Lot I, Class 1, for the largest and best "display of cheese" (quality and variety considered), by any dairy association, dairy board of trade, or dairy produce exchange, if manufactured by the members thereof — 1st premium, $300; 2d premium, $200; 3d premium, $100. Judges — S. B. Davis, C. E. Udell. Umpire — E. B. Jennings.

The *First Premium* was awarded to the Wisconsin Dairymen's Association.

The *Second Premium* was awarded to the Sheboygan Co. Dairy Board of Trade.

In Lot I, Class 2, for the largest and best "display of cheese" (quality and variety considered), by any individual manufacturer — 1st premium, $100; 2d premium, $75; 3d premium, $50. Judges same as in Class 1.

The *Second Premium* was awarded to Geo. C. Mansfield, Johnson's Creek.

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The following table shows the entries in lot K, classes 1, 2, 3 and 4, and the award of the judges, the premiums in each class being alike, $75, $50 and $25:

NAME OF EXHIBITOR.	Flavor.	Quality.	Texture.	Color.	Salting.	Total.	Grand total.	First premium.	Second premium.	Third premium.
CLASS 1, FANCY CHEESE.										
G. C. Mansfield	28	28	17	10	9	92	....	....	....	....
	26	26	19	9	9	89	181	....	$75	....
CLASS 2, SWITZER CHEESE.										
John Luchsinger	28	10	25	20	10	93	....	....	....	....
	27	10	25	20	8	90	183	....	75	....
CLASS 3, LIMBURGER CHEESE.										
F. Luchsinger	25	20	20	9	10	84	....	....	....	....
	25	21	20	10	8	84	168	....	75	....
CLASS 4, SAGE CHEESE.										
Chester Hazen	25	28	18	8	7	86	....	....	....	....
	20	20	15	5	10	70	136	....	....	$50
F. E. Carswell	27	28	17	10	9	91	....	....	....	....
	30	25	20	10	10	95	186	$100	....	....

The sweepstakes on dairy butter, Lot B, Classes 1, 2 and 3, fifty dollars and gold medal, were awarded to J. G. Flack, of Elkhorn, Walworth, county.

The grand sweepstakes (every entry awarded a first premium in lot G, and no other shall compete for this premium) one hundred and fifty dollars and gold medal, were awarded to H. Z. Fish, of Richland Center, Richland county.

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The following table shows the number of premiums on dairy products, to the different states at the World's Exposition, New Orleans, for 1885.

	Premiums	Value.	Percentage.	Medals. Gold.
CHEESE—				
Wisconsin	71	$2,838	.84	1
Minnesota	5	325	.10	0
New York	6	135	.04	0
Vermont	3	67	.02	0
Total	84	$3,375	1.00	1
BUTTER—				
Iowa	22	$1,566	.67	1
Minnesota	21	1,264	.30	1
Wisconsin	11	534	.13	1
Vermont	11	631	.15	0
Mississippi	1	75	.02	0
Indiana	1	51	.01	0
Missouri	1	50	.01	0
Dakota	1	50	.01	0
Total	69	$4,221	1.00	3

DAIRY IMPLEMENTS.

Cornish, Curtis & Greene, Fort Atkinson, were awarded first premiums, a medal and diploma, on each of the following articles, at the World's Exposition, New Orleans: On rectangular churns, farm butter workers, Curtis' improved factory churn, Mason's central drip butter worker, first prize dog power, windmills for dairy use, gold medal for best display.

BUTTER COLOR.

F. F. Fargo & Co., Lake Mills, were awarded first premium —medal and diploma.

RESOLUTION.

The following joint resolution, proposed by Hon. Pliny Norcross, in the Assembly, at Madison, February 6, 1885, was adopted unanimously by both houses of the legislature:

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WHEREAS, The World's Exposition, now in session at New Orleans, after a competition which embraced the dairy products of England, Denmark and Holland, and, in fact, the entire world, has awarded to the dairy farmers and associations of Wisconsin the following high premiums:

Ten important premiums on butter; ten important premiums, largely first, on cheddar cheese, together with the grand sweepstakes prize of $150, and gold medal in this class; besides, in the great pro rata prize of $1000, to be divided among all exhibitors in this class taking premiums, there were awarded fifty-five premiums, and Wisconsin sweeps the board by taking fifty out of the fifty-five. In the grand prize of $300, to any dairy association or dairy board of trade, the Wisconsin Dairymen's Association takes the first and the Sheboygan county board of trade the second, of $200. In the largest and best display of cheese by any individual manufacturer in the world, Wisconsin takes second. In the best display of fancy cheese, Wisconsin takes the first. In the best display of Switzer and Limburger, Wisconsin takes first in both. In the best display of sage cheese, Wisconsin again takes first; and

WHEREAS, The high honor of being one of the foremost dairy states in the Union has been achieved by the zeal, industry and enterprise of our own dairymen and dairywomen; and

WHEREAS, We recognize the substantial awards of merit the most convincing evidence that the dairy farmers of this state in the face of many obstacles and with but little state encouragement, have built within our borders a most healthful, honorable and magnificent industry, and have brought wealth, honor and renown to our commonwealth, and in this grand beginning, which now reaches a product of $20,000,000 annually, have demonstrated the certainty of still greater future success; therefore, be it

Resolved by the Assembly, the Senate concurring, That the legislature of Wisconsin herewith tenders to the dairymen and dairy owners of this state its most profound acknowledgments and earnest thanks for the great work which

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they have performed, and it hereby pledges itself to do whatever is right and reasonable to aid them in securing still greater achievements.

[Attest] [Attest]

CHARLES E. BROSS, E. D. COE.

Chief Clerk Senate. *Chief Clerk Assembly.*

The expenses of the office for the past year were $90.25. An itemized account has been furnished the executive committee.

Respectfully submitted,

D. W. CURTIS,

Secretary.

INDIVIDUAL DIFFERENCE IN DAIRY COWS.

By PROF. W. A. HENRY, of the State University.

One of the essentials of a good dairyman is the ability to distinguish between a good and a poor cow. That some men without any particular training can point out quite accurately the good animals of a herd we all know, but to most of us there is no royal road, and wisdom comes only with study and experience. It is not so much the occasional failure in buying a cow, however, that works against a dairyman as it is the lack of ability to determine and appreciate the worth or worthlessness of the animal after purchase. To know which cows to retain and which to sell, that the standard of quality in the herd may be constantly advancing, is the ever-recurring problem with the vigilant dairyman.

I maintain that the difference in value between a good and a poor dairy cow is too great for any one who is governed by hard money principles to substitute guesses and estimates for the solid facts, which may and should be brought out by carefully kept records.

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Of the infinite number of differences that may, and do occur in the individual members of our herds, I will here speak of three or four which have a practical bearing, taking the facts and figures from the records of our little herd at the farm of the experiment station.

One of the first differences that strikes our attention, is the variation in time of giving milk between two cows. A cow may, by giving a large flow for a time, delude the owner into the belief that she is the leader of the herd, when in truth her total yield may fall below that of some very ordinary members of the herd. To illustrate this let us look at the record of two of our cows, Cherry and Doubtful, the former having dropped her calf April 28th, the latter May 28, 1883.

In the beginning Cherry's yield was very satisfactory, and continued so for a time, when it rapidly fell off, while Doubtful, starting with but a moderate record, gave the greater quantity by the close of the season.

MILK RECORD.

MONTH.	Cherry.		Doubtful.	
	Lbs.	Oz.	Lbs.	Oz.
May	1,172	1	....	....
June	1,008	4	931	11
July	889	12	842	9
August	682	0	738	0
September	544	0	606	15
October	407	12	466	4
November	123	12	424	8
December	.....	....	335	0
January	.....	....	460	12
February	.....	....	345	0
March	.....	....	93	4
Total	4,777	9	5,253	15

By the table, we see that Cherry's record for the first three months is over 3,000 pounds of milk, or about 500 pounds more than that given by Doubtful in the same length of time, and a hasty judge might have considered her good for a couple of thousand pounds more than that cow, by the

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close of the season, yet, by the record, we see that Doubtful's yield was nearly 500 pounds in excess of Cherry's.

The record brings out plainly the great fault of this cow that starts out so finely, and reduces her to the rank of a very ordinary cow.

A good flow of milk, well maintained, is a prime requisite, but we must not stop with this unless we are selling milk by the quart, and care nothing for quality. A cow may deceive us as much in the quality of the milk given as in any other way. I can not illustrate this any better than by showing what the churn told us of four of our cows, of four different breeds.

Name of cow.	Breed.	Milk for 1 lb. of Butter.
Winnefred	Holstein	56 lbs. 13 oz.
Asylum	Ayrshire	29 " 0 "
Heroine	Short-horn	31 " 0 "
Nibbie	Jersey	13 " 6 "

These cows all happen to be full bloods, but it is not between the breeds that I here wish to introduce the comparisons. A churn test showed just these results with the milk of the animals here named, and the variations are so striking that they must arrest the attention. How easily one might be deceived with these cows if only quantity of milk was looked at. A good pailful of milk is a most satisfactory sight to a dairyman, yet quantity is one of the most deceptive measures we have.

The third point I wish to touch upon is the great difference in the returns for the food given. To illustrate this, I instance the case of two cows which stood side by side in the stanchions during the early part of this winter. The food of the cows was the same—five pounds of sorts two and a half each of corn-meal and ground oats, and about twenty pounds of mixed hay. Both cows were fresh and doing their best. Hacker, a native, was giving from one to three pounds of milk more per day than the Jersey Nibbie, and was held to be the equal of any cow in the barn; the churn showed her butter record to be one pound two ounces,

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while Nibbie's was one pound and fifteen ounces. At twenty-five cents for butter, the little Jersey was giving about twenty cents a day more than her neighbor, and this, too, without extra feed or care.

A fourth difference is not between different individuals, but a difference in the same individual in different years. In the natural existence of every good dairy cow, there is a season when, through age, and fortunate surroundings, she makes, or can make, her best record. This should be borne in mind by the dairyman in measuring the values of the individuals of his herds.

Here is the best monthly record of two cows for two seasons:

	1883.	1884.
Cherry	1,172 lbs. 1 oz.	866 lbs. 8 oz.
Doubtful	931 " 11 "	1,353 " 4 "

In 1883 Doubtful was purchased, and brought to the farm before calving. She was not wonted to her new quarters, and did not thrive as she should have done. Had we judged her by her first year's record, she would have taken the wrong position in the list.

I have here pointed out a few individual differences, giving a single illustration in each case. Not a person who hears this paper and has kept cows but could add others if he has been observing. The point I am trying to reach is briefly this: the milk of each cow should be weighed and recorded each milking, and occasional tests should be made of the quality of the milk by churning it separately.

I know I shall be met with all sorts of objections, such as "Too much trouble," "It will take too much time," "Can tell well enough how a cow is doing without," etc., but, I claim, not one of these excuses is valid with progressive farming. A good business man must know every detail of his business, and have all these details under careful supervision. A cow is too expensive a machine to be run hap-hazard and by guess for years.

I maintain these records should be kept and studied for the following reasons, though I shall not enumerate all:

It will induce more careful milking. The one milking a

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cow, upon finding the quantity of milk decreasing, is careful to drain the udder at the next milking to increase the record. The owner of the cow, by means of the record, follows the yield from day to day, and when a fall in amount occurs, naturally inquires of the milker the cause.

It induces regular and liberal feeding. The owner comes to look upon his cows as machines which must be supplied with grass, rough material, as hay, grain, etc., out of which can be made the finer products of milk, butter, and cheese. The record is a daily hint that there is a close relation between food and product.

The daily record and the butter test with the churn, together, soon reveal to the owner the valuable animals of the herd, as well as the poor ones. These last can be disposed of and replaced. In this particular alone, a record is worth all it costs.

Many a dairyman now listening to this paper has a cow or two that is worth ten times as much as others in his herd; yet, he may not hold the best of his herd at over $75, while for the poorest he would not take less than $30 or $35.

If it is a fact that one cow may be worth several times as much as another, who ought to know it if not the dairyman owning both, and how can he if he keeps no record?

Not only do we come to appreciate certain animals of the herd more highly, but we will be better prepared to select calves for the future herd if we know exactly what the dams are doing.

A pair of scales for weighing milk can be had for $5, or spring balances costing less will answer.

A sheet of paper, ruled and tacked on a board, and a lead pencil, will complete the requisites.

Begin at once to note what each cow yields, and after two or three weeks, when you have made up your mind as to just what each is worth to you, begin and set for one day the milk of each cow separately, taking one at a time. Upon churning, you will be surprised at what changes you will make in the list. If you do not have a little business with the cattle buyer or butcher as soon as you can dry up and fatten some of your herd, you are fortunate.

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DISCUSSION.

Prof. Henry—There is one thing that I want to impress upon you; that is, the importance of keeping a record of what your cows do. Use the scales; keep them handy. They have done more to advance the cause of science than any other article; and when we bring the scales into dairying we have done more to advance dairying, and the interest we take in it, than anything else. Then, if you only rule off a piece of brown paper and put it down on that—keep some kind of a record of what your cows are doing—then you will know what they are worth. I want you to try it; put it down in words, on paper; then when you find out that you have a cow that is giving two pounds of butter a day, it will go into the list of the glorified cows.

Mr. Hoard—A gentleman by the name of Brandell, in Jefferson county, said to me: "You have been trying for a year or two to coax us fellows to test our cows, and I had my eyes opened the other day on that." Now, he is one of our best dairymen; a profitable dairyman, too. He has very keen judgment, and his eye on a cow is worth more than a great many men's further experiments. He says: "I had a cow that I paid $50 for; I thought she was a good cow. I was certain from the character of her milk that it was rich and contained a good supply of butter fat; I had no doubt but what I should get a handsome return on her keep. But," he says, "under the influence of being talked to about testing cows, I concluded to put this cow under test. In the first place I tested her percentage of cream, and that disclosed to me the fact that the cow was absolutely worthless in my herd." Well, now gentlemen, the cream runs up in some instances to as much as forty-five per cent., and he only got eight per cent. He came to me and asked if I could tell him what was the matter. I said: "There are two conditions: everybody knows certain milk is very sticky and will hold the cream—it won't rise. There seems to be a sort of a gluten in the milk, and cream globules won't rise. Perhaps the milk of your cow has very small globules. The difference between the Jersey cow and the

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Holstein is the difference in the size of the cream globules; the Jersey has large cream globules, which come bounding to the top very quickly. The Holstein has small ones, which do not raise quickly; consequently, the Jersey skim milk won't be worth as much as the Holstein skim milk." He says: "What shall I do with this cow?" I says: "I don't know; if you cannot make any use of her you had better sell her." He says: "I'll tell you what I will do; I think a calf's stomach will extract that fat." I said: "I don't know anything that a calf's stomach won't extract." He put that cow to feeding calves, and she has done wonders. That was where she was valuable.

Mr. Clark—We want to learn something from these dairymen who have studied and experimented. We want to know, for instance, whether we shall get the best results from deep or shallow settings. My mother used to set in earthen pans quite deep; they were not in use very long; then they went to tin. Now we have deep settings, with ice to make it raise. That is something we didn't know anything about until quite recently; if they did, I didn't know it. Can one of these men tell me, after all their study, whether the result is better or not from deep setting—setting fifteen or eighteen inches deep, three pails in a can, and fill it with ice—whether the same results could be obtained, or more cream raised setting about three or four inches? We stand here theorizing, but practically, how is it? We are none of us employed by the State; we are able and willing to employ Prof. Henry; we are glad to get his knowledge, but we can't all have testers and scales, and all that sort of things.

Mr. Hoard—You have all of you got brains.

Mr. Clark—Yes, but we haven't got time; we farmers have something else to do besides trying this cow's milk and that cow's milk. I have got a pair of scales myself, and I can tell you what it costs to raise a pound of butter in my dairy. But we have to go slow here, because Prof. Henry says Jersey cows are the best. We cannot start out and pay $100 for a Jersey cow; you have got to grub a little; it won't do to run alone before you can stand. When you

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come to reckon the interest on that cow, and the feed, I don't believe but very few farmers would feel that they could do it.

Prof. Henry—In forty days the Jersey will pay the difference in the interest, and at that she is cheap at $100 if the other cow is worth $50.

Mr. Clark—I don't think that the general farmer can do it.

Mr. Hoard—That is what bothers us; we want particular farmers, not general farmers.

Question—I believe there was something said here about deep settings; I would like to hear about that.

Prof. Henry—Let me tell you about that—both are proper. There is no difference in the amount of butter obtained from shallow settings or deep settings. The result of the Danish experiments shows that by the proper setting you can practically get all the fat out of the milk whether it is deep or shallow. It is like many other things, it is a matter of convenience. If a woman wants to wash a large number of milk cans and put them out in the sun to keep them clean, rather than set the milk in ice out of the way, of course it is a question of convenience and preference.

Mr. Hoard—The deep setting brings up the cream in six hours and the shallow in twenty-four.

Prof. Henry—The shallow setting gives us sour milk, which we cannot use in raising calves; the deep setting, in ice, gives us sweet milk, which is profitable feed when warmed, for calves and pigs. There are a great many farmers' wives in this audience that live where they cannot patronize the creamery—they are interested in this dairy question. I think the best way for you to do is to sell your butter to private families in the city. I stopped with a family up north here in Pierce county, where the young lady supplies seventeen families in town with butter, regularly, at a stated price. There are many people in the cities who would be glad to purchase their butter directly from some maker.

If our farmers' wives will go to their city friends and say, "I have some butter that I wish to sell, and I will let you have it if you are willing to pay me twenty-five cents the year around." And you ought to get that on such a con-

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tract. Then make arrangements by which you shall have cows fresh to allow you to keep your contract; that is the first thing for you to look out for, or the cows will all be fresh in the spring, butter will be worth eighteen cents, and you will have plenty, but winter will come on, when these people will have to pay a big price to supply themselves, and you cannot keep your contract—you cannot send to them.

Deep setting, without doubt, is the most economical if you can use ice. You need not wash your can more than once a week if you are ordinarily careful in handling your cream. Then the skim milk is good feed for your calves, but don't feed it cold from the ice—warm it up. I have had calves gain over two pounds a day on oats and skim milk. I know a gentleman who is feeding one hundred calves on skim milk, and he says the calves are as good as those that run with the cows. But one thing I want to tell you: whether you set your milk deep or shallow, you want to use a modern method of churning.

Question — Wouldn't you advise a churn with a dash or a whirligig inside?

Prof. Henry — No sir, I don't believe in it at all. As to the temperature at which you shall churn, it varies with circumstances, but I should say about sixty-four to sixty-six. Take your thermometer out, clean off the gauge and see that it is sixty-six. Begin churning, and as soon as your butter comes the size of wheat grains stop churning, now, that is why you cannot use a dash churn, you can bring it to wheat grains with a dash churn, but after that there is no way to relieve it of buttermilk as there is in the other churns. You pull the plug out from the bottom and you hold your strainer under and what little butter runs out you can put back in the churn. Have a pail of cold water there and a little salt if you wish, pour in that water, close up your churn and turn over a number of revolutions, the butter drops apart and the water passes through it, clean out the buttermilk. If you repeat that process two or three times until the water runs out clean, the granulated form is not then lost. It will roll off your ladle just as wheat will.

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There are a number of ways of salting, generally about the rate of one ounce of salt to the pound of butter; as to color, put your color in before you close it up to churn, don't try to color your butter afterwards. My father used to say, if you wash butter you wash the flavor out. You need not be afraid of that, you cannot wash the flavor out of butter. You see to follow out this method of doing it only requires beyond what you probably have, a churn. Suppose you try it and like the results you reach, then I would advise deep settings; there's the Cooley and a number of others. It is like a sewing machine, whatever you like best; I am talking now for private dairying, none of these suggestions would have any bearing on creameries.

Mr. Gorton — Here is a resolution I would like to offer and bring it before you:

Resolved: That it is the sense of this convention that the dairy interests in this state demand the passage of a law prohibiting the manufacture of adulterated butter in any form.

Why I would do this, is simply this: You read the market reports of the value of butter, you ask us why we can't get more for our butter. There are several causes, but the principal is this, that we have to enter into competition with bogus butter, which brings more than the average creamery butter in the Chicago market. It brings twenty-eight cents when the best butter brings thirty-two cents and common at twenty-six.

Motion to adopt and seconded.

Mr. Clement—The resolution speaks of adulterated butter. Is it intended to include more particularly counterfeit butter?

Mr. Gorton—What I am after is butterine.

Mr. Hoard—I understand that all counterfeit butter contains some butter. Thirty per cent. butter is the usual formula, and seventy per cent. neutral oil.

Mr. Gorton—I wish to bring before you the idea that we want to get rid of this, what is called oleoine, margarine, suine, or any other "ine" that competes with butter and is

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driving us out of the market with common butter, not only our dairy butter but our factory butter.

Mr. Hoard—The fact is, gentlemen, that Chicago turns out of this counterfeit butter, as much as all the cows of Iowa and Minnesota are making. Then, when you add to this all the other cities of the United States that are making counterfeit butter, you get at a very fair relative commercial idea of the situation. Now, a variety of efforts have been put forth to invoke the power of legislation. The thing is on its face a fraud, an injustice. A great moral wrong is being done every day. Let me say that the wholesale dealer of Chicago does not sell his butterine for anything only butterine, it is branded, but he sells to the grocer and the boarding house keeper, and when we consider that ninety per cent. of all the butter sold in the United States is sold by the pound, we can readily conceive that no brand can be made upon the mass of butter sold by the pound. The question is full of difficulties. Without a direct violation of the law requiring the branding of this stuff, the consumer is deceived.

Question—Is he injured?

Mr. Hoard—He is injured in this particular, he is given something he did not ask for. If you ask me chemically or physiologically of its effects, I have got this to say, I don't know that pork fat rendered at the heat that all lard is rendered—from three hundred to five hundred degrees,—I don't know that that fat is injurious, but remember that this neutral oil is rendered at not to exceed one hundred and twenty degrees, from one hundred and twelve to one hundred and twenty. They take the caul fat and suet of the hog and subject it to a gentle heat and bring it up to one hundred and twenty and then extract this oil, that is called neutral oil, because it is odorless and tasteless, but it is a surreptitious undertaking and manufacture, and you have no protection from these men, by virtue of the fact that they will fairly argue that they will make it as cheaply as they can make it, and as much as they can, and as a consequence you have no protection against their introduction of deleterious fats. This much is clear common sense, that these

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men ought by virtue of the natural law of right, to be forced to so conduct their business that they shall not enter into an unfair competition with the dairymen. I have had some hesitation in trying to do anything about this matter. In the agricultural convention two weeks ago some gentlemen asked me why I didn't "pitch in." I said, "Why, I am appalled at the size of the undertaking; bless you, I would like to pitch in. I have been pitching in a good many years, and I haven't been so well backed sometimes as I thought I ought to be."

Mr. Gorton — We are farmers here, we are the ones that are going to suffer, our legislature says "Why don't you ask for what you want, you never ask for anything, how do we know what you want?" I would like to see the resolution put before the house.

Mr. Curtis — Mr. President, I believe that every one here is ready to vote for this resolution or anything else that will hurt butterine, but is this resolution just what we want to pass? Hadn't we better postpone the resolution until after dinner and then we will talk it over and see if we can't put it in different shape so it will be a little better or different from what it is.

Mr. Morrison — I move this thing be referred to a committee of three of which Mr. Gorton shall be chairman, to report at our afternoon session.

Motion seconded. Committee appointed by the chair consisting of Mr. Gorton, the president and Prof. Henry.

Convention adjourned to 1:30 P. M.

AFTERNOON SESSION.

Convention met pursuant to adjournment at 1:30 P. M. W. D. Hoard in the chair.

J. M. Smith, Green Bay — *Mr. President, ladies and gentlemen*: I have been requested to tell you a little about New Orleans and the great exposition there. I was appointed one of the commissioners from our state to get up an exhibit and go to New Orleans with it, and, after a good deal,

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of hard work by both Mr. E. D. Holton and myself (he being the commissioner with myself), we went together, and after some four or five months of steady hard work we got up a very creditable exhibit, got it down to New Orleans and set it up there. This was a representative one of the industries of the state, representing the grain, the cereals, corn. We have thirty-nine varieties of corn, and I think there is no finer exhibit of corn in the whole building than we have from Wisconsin. Our grain is also a very fine representation of all the different kinds of grain, and flour made from them. We have a very fine exhibit of honey, very handsome indeed; with the exception of California there is nothing larger, and there is certainly nothing finer in the line of honey than Wisconsin honey. In the line of sugar made from amber cane, I think we have the finest in the building. Minnesota has a larger amount, but not nearly so fine as the sugar from this state, and so with our syrup. Then we have samples of our manufacturing interests; a very fine lot of samples of the different kinds of wood from nearly all our forests.

I have been speaking of the exhibits, in the government building. There are really two distinct expositions there, the large main building covering about thirty-three acres, in which are exhibits for premiums, and the government building, so named because the government itself has its exhibit there; an exhibit for which they appropriated $300,000 to put up this building and it is really a magnificent thing. That of itself would pay any of you to go down and examine it, study it. The government exhibit is nearly in the center of the building. Then each state has its place around on the outside of the building. Wisconsin occupies one of these places. Our goods are nearly all put up in glass cases so that they are protected from dust. We had cases made and took them with us from Milwaukee; there are thirty cases, four feet wide, six feet long and six feet high. Those are filled with these goods. In addition to these there are five large cases that are hexagons, or six sided; those are ten feet in diameter and ten feet high. Those first named occupy along the side of our space; then the five larger

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ones occupy the center, making a third row; in that way our goods are placed very nicely and I think I may say without boasting that the general feeling is that there is no state in the Union that has a more nicely arranged exhibit than Wisconsin. We are constantly receiving compliments on the nice pleasant arrangements.

In the main building, as I have told you, exhibits were put which were competing for premiums. There was where cheese and butter dairymen went in and made their exhibits, and I may say to you without boasting that in that line no state stood as high as Wisconsin, in New Orleans.

The State Horticultural Society has made an exhibit of apples of Wisconsin, and perhaps it will be new to some of you, when I tell you that no state in the Union had so fine an exhibit of apples as Wisconsin. Perhaps Nevada may have had a few that would average larger, but not even California had as many as Wisconsin. I would like to give you an idea of how the premiums went. The country was divided into three sections. The section that we belong in took everything north of forty degrees north latitude and east of the Rocky Mountains; that takes about down to Central Illinois and Central New Jersey; thus we had for competitors almost the entire apple growing district of the United States. There were seventy-nine premiums awarded upon apples; of those Maine took three, Conneticut three, Vermont one, New Hampshire none, Massachusetts none, New York none, New Jersey none, Pennsylvania two, Ohio two or three, Michigan two or three, Missouri one, Illinois seven, Nebraska seven, Kansas two or three, Iowa thirteen, Minnesota two, Wisconsin *twenty-six* taking double any other state. We took, also, out of seventeen medals, seven. We took about one-third of all the money premiums awarded and fully one-third of the medals. We were, of course, feeling pretty good about this and right upon the back of that the premiums were awarded upon cheese and the cheese dairymen of Wisconsin, as you know from others, made a clean sweep.

The comparison between the cheese dairymen of Wisconsin and the other states is about as follows: Wisconsin has

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taken about $3,400 in cheese and butter together; the two states next highest to Wisconsin are Iowa and Minnesota, they together have taken about $3,100 or $3,200. Thus you see that Wisconsin has taken more than the two next highest states together, and if Mr. Holton and myself had not been crippled for means, if we could have said to the dairymen, "Gentlemen, go ahead and make your exhibit of butter and cheese just as good as you can, and we will stand behind you," they would have cleaned the board as completely, I believe, with butter as they did with cheese, but we could only promise them a limited amount, and they acted wisely and put the most into their cheese exhibit and made a splendid success of it. In addition to that there is no finer machinery in the main building than that from Wisconsin. The Allis engine, built by Allis & Co., of Milwaukee, is a most magnificent thing, and is equal to anything there is there, although there are eight engines upon that one platform. So that taking all these things together you see Wisconsin stands very high. Some of them asked me what kind of a country we have up here. "Oh," said I, "we live in God's country up there, we live well, eat well, drink well and sleep well." I was going to tell them we voted the Republican ticket, but I thought that would not do.

Mr. Hoard—I desire to announce that the Northwestern Dairymen's Association will meet in Algona, Iowa, on Tuesday, March 10, for a session of four days. This association is the largest of its kind in the United States. The program has been carefully prepared and it is expected that some very important work will be done, particularly in demonstrating the various methods of extracting cream. The new creamery of J. Wallace & Co. will be turned over to the association for that purpose. As one of the officers of the association, I desire to extend to every person here, and in this portion of the state, a cordial invitation to meet us at Algona.

Mr. Gorton—As chairman of the committee, I will say we

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compromised a little, and the resolution now reads as follows:

WHEREAS, the manufacture of oleomargarine and butterine has assumed a magnitude of alarming proportions, and the deceptive manner in which it is placed upon the market is a fraud upon the public, as well as destructive to the best interests of state.

Resolved, That the organization demands of the Legislature the enactment of a law framed with such wisdom and efficiency, if possible, to protect the consumers of butter, and incidentally to foster the great interest which we represent.

Motion to adopt, seconded and carried.

Resolution offered by Mr. Clark:

Resolved, That in the judgment of this association, the time has arrived to establish an agricultural school, as provided for in a bill introduced by Mr. Adams, of Dane county. We believe a more general diffusion of sound agricultural knowledge can be secured by the teachings and experiments of such a school than can be obtained in any other feasible way; and that agriculture, in its varied branches, being the leading industry of the state, and its taxes more largely raised from the tillers of the soil than from any other class, justice demands that the farmers should have the benefit of a larger portion of a higher and better education in their calling, as well as the followers of other professions that are so liberally fostered by the state; and, therefore, we ask for the passage of said bill.

Motion to adopt seconded.

Mr. J. M. Smith—*Mr. President, Ladies and Gentlemen:* I just came from Madison here. I talked with several members of the legislature about our college. They say: "We are ready to do whatever you want done. If you want an agricultural college you can have it." Says one: "I am at a loss to know what to do. I am ready to vote for it if I am satisfied that the farmers want it; and I don't want to vote away the people's money unless it is wanted." And I think that man expressed the views of nearly all the members of the legislature. They are ready to do whatever the farmers ask for.

It seems to me that the time has come when the farmers ought to have some place where they can go and get a farmer's education. It is true that we have an agricultural branch in our state university, and it is also true that in the history of these agricultural colleges, where they have been attached to the state university, or a classical school of any

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kind, they have proven to be failures. I think there is no exception in this country to that statement.

On the other hand, where they have been separated from any other institution they have been successful. I hope this resolution will pass by a unanimous vote.

Mr. Hoard—Mr. President, Mr. Hill here makes a suggestion that the resolution should not ask for a college for the education of farmers' sons, but for the education of anybody's sons. I don't think we ought to say that the farmer's boy ought to be a farmer, anyway, and a mechanic's son ought to be a mechanic; but that we ought to have some system in this State whereby a knowledge of agriculture can be taught; and if the resolution covers that ground sufficiently, broadly, I am in favor of it.

Mr. J. M. Smith — It does embrace that and nothing else. We none of us wish to be used for farmer's sons and daughters and nobody else. We wish it to be understood that it is for everybody that comes there.

Mr. Favill — I want to repeat what I said the first day: that it was the largest gathering that I had ever attended on the first day of the meeting of this association, and now I have the same to say of the last day, and we feel a little flattered by it, we are going home feeling pretty good. I want to say one thing. There are ladies here, house keepers, who have three or four or half a dozen cows and want to make butter, and they haven't any sort of facilities, no place to set the cream, nothing necessary to do with. Let me ask you gentlemen, for God's sake, give them something better. Your wife with the kind of facilities she has will make butter that will bring you perhaps fourteen to sixteen cents a pound, when if she had things as they ought to be she could make butter that would sell for thirty cents. Your wife can not do her best with no appliances. The thing is of course to do the best you can with what you have, and can rig up, but get better as fast as you can. This is the very best convention I ever attended. The audience has appreciated everything that has been offered, and here you are yet six or seven hundred strong, just the last afternoon when we are going off. Well, good bye.

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Prof. Henry — I this morning had the pleasure of visiting the creamery over the other side of the river, and I was informed that they churned but one day in the week. Now, farmers, there is something wrong up in this part of Wisconsin, you are patronizing the creamery in a weak way. Now, no merchant could afford to open a store one day in the week. He would have to sell out and go to a place where things were more enterprising, and it is the same with the creamery business. Last year when I was up this way and scolded you farmers, I thought I saw the promise of better things in your faces, and now I find things just about as bad as they were before.

Mr. Gorton — I guess we have doubled.

Prof. Henry — Then I want you to double again more than double in the next year. You must stand by this creamery or else choke it right off; have it die at once. Now, I want to refer again to skim milk. You know that I told you about my calves, who are gaining from ten to fifteen pounds a week on skim milk. If this creamery is to be profitable it depends largely upon how you are going to use your skim milk that you have left at home.

Those calves got eight quarts of skim milk a day; all excepting two of them that got eleven, the two older calves. It is warmed up and shows by the thermometer 90 or 100 degrees. We feed it in three feeds; our experiment in feeding hogs is the same. We found after trying all sorts of ways that we got the best results to make a thick pudding with the skim milk and corn meal. I believe that in dairying that it is on the skim milk that our profit comes in very largely. I wish you would take two or three cows and try a little experiment on them; feed them heavily and see if you don't have more cream to come to the factory the next time the wagon comes around to gather, and if your cows are dry now, feed them well, that is one of the greatest mistakes a farmer makes; he lets his cow get poor at this time of the year.

When she first becomes fresh she has used her strength in raising the calf and in giving it birth, and her energies are gone; she wants to be well kept up. Keep up your

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cows. Don't sell your hay at $5 a ton or let this elevator take your oats at the price they give you. The next mistake the farmer makes is when the fall comes on and the cows dry up, and there is not feed enough, they should feed heavily; look out for these things and your creamery will be a success. The large amount of butter that will be made there will diminish the cost per pound.

I want to thank the editors of your local press for what they have done in helping us. The success of this convention is largely due to two or three farmers in this vicinity and the local press, in talking it up to the citizens of Arcadia.

Mr. O. C. Gregg, Camden, Minn.—Mr. Chairman, your time is short, but I want to say a few words because I maintain there are some in this crowd who are exactly where I used to be. I got my first and best help in just such a convention as this. I am talking from a farmer's experience, and if you should see me three hundred days out of the three sixty-five, you would see me in overhauls and blouse; I milk on an average eight cows before breakfast, and do it in the winter time before daylight. I am proud of the fact that I am a farmer. Now, as to the success of dairying with a private dairyman, these creamery men may kick a little, but let them kick, you can make better butter than they can. The best butter made by private dairymen is wanted in every city in this Union, and wanted badly; there are certain rules you must comply with. In the first place you must have a good cow, but more important, keep her clean, make a platform upon which she shall stand, a trench behind her about eight inches deep, and have that platform short enough so that her hind feet will just rest squarely upon the hind edge of the platform; now, put plenty of straw upon that platform for the cow. Now you have got a clean cow. I know of a cow in Minnesota just as white as snow; you take her out of the stable any day and she is just as white as she ever was.

2. Feed good feed; you can't get a good quality and quantity of milk without feeding good feed, and plenty of it. After you get your milk; submerge it. You heard what

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Prof. Henry said about that, and he is right I think. When the milk is submerged it is safe from the odor of cabbages or anything else. Then, in order to ripen your cream, you can heat it; raise it as high as seventy degrees. Put the can right in a dish pan of water, keep it moving all the time, and when your thermometer shows it is warm enough take it off. The next thing when that cream gets to the point of ripening, when it gets to be just a little acid, then say whoa! to everything else and churn, that must be churned right then and there. Now, to prepare it for the churn, the thermometer shows that it is down to fifty-seven or fifty-eight, it must be raised to sixty-four, then put it into the churn and use one of these box or *rectangular churns*, the next thing put in your coloring, you must color the butter sure. I ain't going to argue the question, you must do it; now churn just as the Professor told you, draw off the butter milk and wash it as he said; I would suggest however, that before you put it in the water, it should be tested by the thermometer and ascertained to be at sixty-four degrees. Salt the butter right in the churn, you will soon learn to know how much to take, then turn the churn. I think Mrs. Gregg turns it twenty-four times, then put it on the butter-worker; and by the way, you want a *lever butter-worker*, something of that kind. When you take it out of the churn put the butter onto a cloth and put the other part over it, so it is wrapped in cloth and has never been touched by the hands, and if you want to turn the butter, take hold of the cloth and turn it, it is a very convenient thing and it saves sticking on to the butter-worker; now, be careful you don't work it too much. I heard a man say that his mother wasted five years of her life in smashing grains of butter. Now, you want to put it in packages and it is ready for market.

Prof. Henry—Do you work your butter a second time?

Answer—No, we don't; we just work it, and put it right into the packages. You want good packages. I have experimented on a good many, and I find Bradley's butter box is a good thing.

Prof. Henry—Would you use a stone jar?

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Mr. Gregg—No; I don't like a stone jar. You want wood of some kind—ash or something of that kind. And I don't believe much in the return packages. I think you will find that in order to keep your dealers supplied, you must have a winter dairy. Fifteen-cent oats can be fed profitably to a cow, when you get twenty-five cents for the butter, and there ought to be a good margin, to say nothing about the fertility to the farm. By keeping the winter dairy, and making your arrangement with your dealer, you can make your winter butter sell your summer butter, and that is one of the best points in the business. I want to say one thing to you. Don't you go away from this place with a single bit of prejudice against this man, because he is an editor, or that man, because he is a professor, or anything of that kind, because I know the things that they have said are in the very direction, which I have found by practical experience led me to success. I wish we had a Prof. Henry in Minnesota, most heartily. I have come all the way from the western border of Minnesota, and I feel well paid for coming. Another thing: Lay in a good supply of books and papers. I have proved by my own experience, running over some four years, that I can keep a good man, and keep him contented, by having my house filled with the best books and papers I can get, and give him time to read them. My father was brought up in New England, where the rule was, that while it might do for some men to do their work and then sit down and take it comfortable, that for the farmer to make a living he has got to get up in the morning, slave away through the day, and go to bed so tired he aches. And there are some men in this country who have got the same idea. I believe it is an outrageous curse on any farmer to have that idea in his head. When I took my farm, a few years ago, I made up my mind that one great difficulty with the hired men was the long, continued labor. A man gets tired and nervous and wants to go off and do something different. I thought I would try and break this thing up, and I made an arrangement that every morning, noon, and night we would take, at least, three-quarters of an hour for meals, when we came to the table, and we would

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all have books and papers; and it cost me just $30 a year for the books and papers. We sat down at the table, and at first it seemed rather odd; the men were a little sheepish about it, but I had mine, Mrs. Gregg had hers, and the result is that those men don't waste any time; they don't comb their hair ten minutes before they get at their books and papers, and we are all looking forward to the good read we are going to have at noon. We are all talking about it. We know all about Khartoum, and what is going on in the world, and, the result is, that the men are contented. They have never failed to come back at four o'clock on Sunday to take hold of the chores, and they have never failed to come home at night, and when I get home there is always one or two of them come out and hustle me in, while they take care of the horses. It is all the outgrowth of books and papers.

The President — We will now proceed to close this convention. We thank you for your kindnsss, and your attention and forbearance.

I have endeavored to keep these old wheel horses at work as hard as possible, and I think we have got a good deal out of them.

I wanted to have told you about our farms in the southern part of the state, to show you how much easier we make more money from one acre of land in the dairy business, than what we used to from five, but it is unnecessary.

If there has been anything whatever unpleasant spoken in the heat of debate, I hope that it will all pass away, and that we will come together in conventions like this, and that we will receive the benefit that they will give us. I understand that the $5,000 appropriation, on the Estabrook bill, will probably give us conventions and institutes in different parts of the state; and I trust that they will stir up that spirit of inquiry that will infuse into the heart of the farmer the conviction that he is just as good as any other man. This idea, of the farmer, that the city man, that the business man is better than what he is, is wrong, and unless you will think that your vocation has got as much dignity in it as their's has, you never will occupy the position that you should rightly occupy. We will now have a song by Miss Perkins.

Song — Miss Perkins.

The President — Again thanking you for the kindness and attention, and the interest you have manifested in this convention, I now declare this convention adjourned *sine die.*

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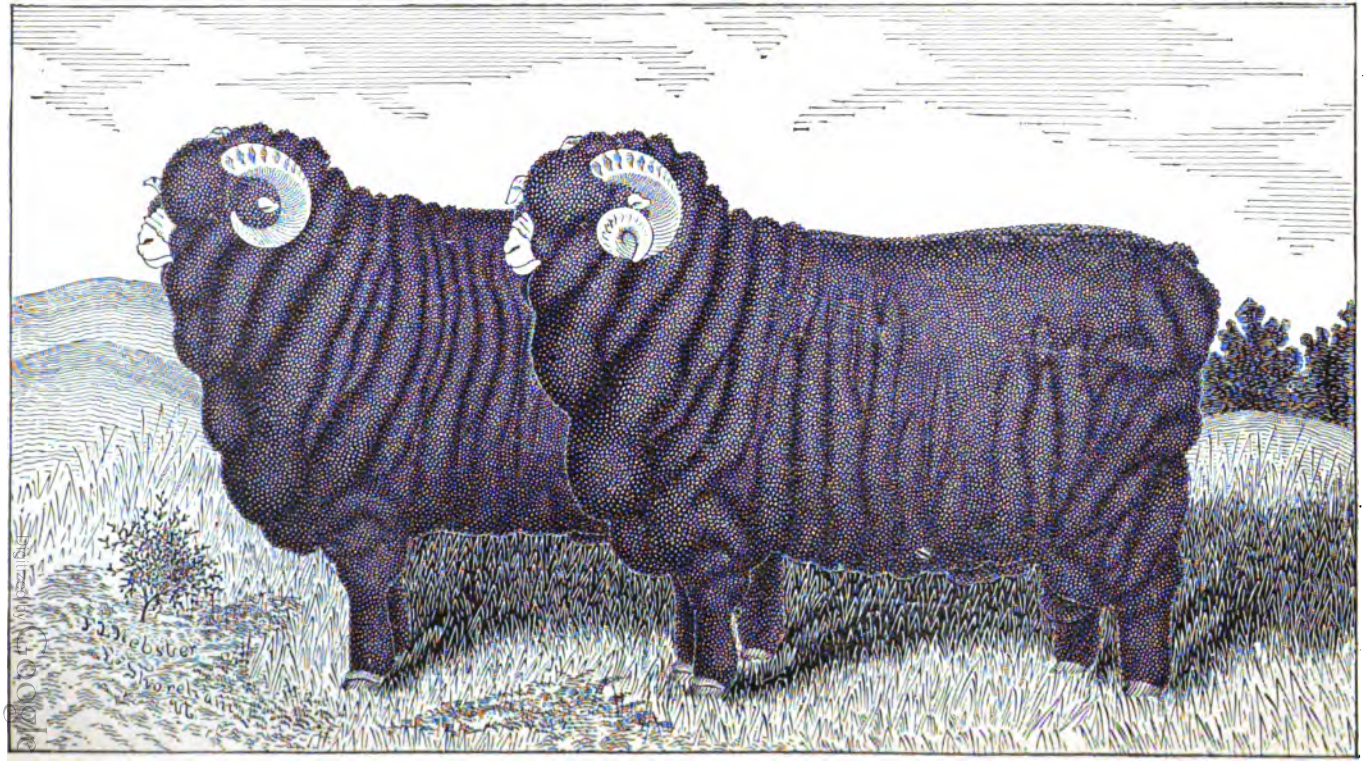

Bred by T. F. & C. D. McConnell, P. O. Address, Ripon, Wisconsin.

SECOND ANNUAL REPORT

OF THE

Agricultural Experiment Station

OF THE

UNIVERSITY OF WISCONSIN,

FOR THE YEAR 1884.

MADISON, WIS.:
DEMOCRAT PRINTING CO., STATE PRINTERS.
1885.

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LIST OF OFFICERS.

COMMITTEE OF BOARD OF REGENTS IN CHARGE OF THE STATION.

HON. HIRAM SMITH, Chairman	SHEBOYGAN FALLS.
HON. H. D. HITT,	OAKFIELD.
HON. C. H. WILLIAMS,	BARABOO.

OFFICERS OF THE STATION.

W. A. HENRY, Agr. B.,	PROF. OF AGRICULTURE.
WM. TRELEASE, D. Sc.,	PROF. OF BOTANY AND HORTICULTURE.
H. P. ARMSBY, Ph. D.	PROF. OF AGRICULTURAL CHEMISTRY.

F. G. SHORT,	CHEMIST.
LESLIE H. ADAMS	FOREMAN OF FARM.
WM. H. MOON,	DAIRYMAN.

Office,	16 Agricultural Hall.
Chemical Laboratory,	18 Agricultural Hall.
Botanical Laboratory,	12 Agricultural Hall.

Experimental fields and barn on the University farm.

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LAWS RELATIVE TO THE EXPERIMENT STATION.

CHAPTER 300, OF THE GENERAL LAWS OF 1883.

AN ACT to provide for an increase of income to enable the establishment of an Agricultural Station, and a chair of pharmacy and *materia medica*, at the State University, and to amend section 390 of chapter 25 of the revised statutes.

WHEREAS, The popular sentiment of the state strongly demands that the growing necessity for increased educational facilities for instruction in the agricultural arts shall be supplied, and that a chair of pharmacy and *materia medica* shall be established at the State University; and whereas, the income of the productive funds of that institution has diminished in consequence of the decline in rates of interest which marks the great increase of prosperity and wealth in the state, until the total income is now inadequate to its proper maintenance; therefore,

The People of the State of Wisconsin, represented in Senate and Assembly, do enact as follows:

SECTION 1. Section 390 of chapter 25 of the revised statutes is hereby amended so as to read as follows: Section 390. There shall be levied and collected annually a state tax of one eighth (1-8) of one (1) mill for each dollar of the assessed valuation of the taxable property of the state, which amount when so levied and collected is appropriated to the university fund income, to be used annually as a part thereof; such increase from one tenth (1-10) to one eighth (1-8) of a mill on the dollar of the assessed valuation of the taxable property of the state, shall be used for the purpose of establishing, under the direction of the board of regents of the university, a chair of pharmacy and *materia medica*, and the establishment of an agricultural experiment station; and in case a surplus accrue from this increase, for the purpose aforementioned, the board of regents shall have power to dispose of the same, in the manner as of other incomes from this source, and the whole appropriation shall be deemed a full compensation for all deficiencies in said income, arising from the disposition of the lands donated to the state by congress, in trust, for the benefit of said incomes.

SECTION 2. This act shall take effect and be in force from and after its passage and publication.

Approved April 2, 1883.

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CHAPTER 435 OF THE GENERAL LAWS OF 1885

AN ACT to amend chapter 320, of the general laws of 1883, entitled "An act to provide for the printing and distribution of the reports of the state officers, departments and institutions."

The people of the state of Wisconsin, represented in senate and assembly, do enact as follows:

SECTION 1. Sections 7, 8 and 9, of chapter 320, of the session laws of 1883 are hereby severally amended so as to read as follows: Section 7. There shall be printed annually by the state printer, and on the order of the commissioners of public printing, the following documents:

1. Thirteen thousand copies of the transactions of the Wisconsin State Agricultural Society, together with abstracts of the reports of the county and other agricultural societies, and such other matter pertaining to the industry of the state as shall be deemed important; provided, the number of pages shall not exceed five hundred.

2. Sixteen thousand five hundred copies of the transactions of the Wisconsin State Horticultural Society, together with such abstracts of reports of county and other horticultural societies, and such other matters pertaining to fruit growing and other horticultural interests of the state as shall be deemed important; provided, the number of pages shall not exceed three hundred.

3. Eighteen thousand copies of the transactions of the State Dairymen's Association, and such other matters pertaining to the dairy interests of the state as shall be deemed most important; provided, the number of pages shall not exceed two hundred and fifty.

4. Eighteen thousand copies of the report of the Agricultural Experiment Station of the State University; provided, the number of pages shall not exceed two hundred. Section 8. Thirteen thousand volumes of said report shall be bound in cloth, uniform in style with volumes previously published, each volume to contain such part of one copy of each of the reports designated in the preceding section, as the compiler shall select, the size of said joint report not to exceed one thousand pages; and shall be distributed as follows: Thirty copies to each member of the legislature; one hundred copies to the State Historical Society: twenty-five copies to each county agricultural society and district industrial association which embraces two or more counties, and furnishes the State Agricultural Society a report of its proceedings; one hundred copies to the State Horticultural Society; thirty copies to each county horticultural society; two hundred copies to the State Dairymen's Association; one hundred copies to the Experiment Station of the State University, twenty-five copies to the library of the State University; five copies to the Wisconsin Humane Society; to the governor, lieutenant-governor, secretary of state, state treasurer, attorney gen-

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eral, state superintendent of public instruction, railroad and insurance commissioners twenty-five copies each; to each public library in the state two copies; and the remaining copies to the State Agricultural Society for distribution by its secretary.

SECTION 9. Twenty-five hundred copies of the transactions of the State Horticultural Society shall be bound singly in cloth and one thousand in paper. Twenty-five hundred copies of the State Dairymen's Association shall be bound in cloth and twenty-five hundred in paper. Twenty-five hundred copies of the report of the Agricultural Experiment Station of the State University shall be bound in cloth and twenty-five hundred in paper for the use of these several societies and departments for distribution or exchange.

SECTION 2. All acts or parts of acts interfering with the provisions of this act are hereby repealed.

SECTION 3. This act shall take effect and be in force from and after its passage and publication.

Approved April 11, 1885.

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LETTER OF TRANSMITTAL.

SHEBOYGAN FALLS, August 6, 1885.

To His Excellency, J. M. RUSK, *Governor:*

Enclosed please find the Second Annual Report from the Experiment Station. I take pleasure in transmitting the same. Its contents will explain the valuable work being done there, which gives satisfactory assurance of its future usefulness.

HIRAM SMITH,
Chairman of Farm Committee.

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REPORT OF THE OFFICERS OF THE STATION.

During the year 1884 the facilities of the Station for experimental work have been very materially increased, and, while further improvements are contemplated, it is now in condition to conduct researches into various important subjects with the care and accuracy which are requisite to secure the fullest and most trustworthy results. A brief statement of these changes may be of interest.

Barn. During the summer the main barn has been extended thirty-six feet in length. This addition was designed to facilitate experimental work in two ways: First, directly, by affording a suitable locality for the conduct of feeding trials, storage of experimental fodder, etc.; and second, indirectly, by facilitating the care of the stock when not in use for experimental purposes, thus leaving more time and money available for the proper work of the Station. The basement has been fitted up as a cow stable. It accommodates twenty-six head, thus bringing together under one roof stock previously housed in several different places, and contains also space for several head of young stock, and a room specially set apart for feeding experiments, in which they may be conducted free from all danger of interference by unauthorized hands. Suitable hay and grain shoots, running water and a cattle scale reduce the amount of labor required in the care of stock to the minimum.

The main floor of the addition has, with the exception of a small portion occupied by grain bins, and by a corn sheller, grinder, and elevators, been reserved for the storage of fodder to be used in feeding experiments. The remainder of the addition is used for storing hay or straw as in ordinary barns.

The barn has also been equipped with a twenty foot geared windmill, the gift of the Eclipse Wind Engine Co., of Beloit, and with all needful accessories, including a pump and a

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one hundred and twenty barrel tank under the roof, from which water can be supplied to all parts of the building, to the dairy house, and to the stock yard.

Office and Laboratories. The former office and laboratory accommodations of the Station in South Dormitory were cramped and quite inadequate to its needs. During the past year the building has been re-modelled for the purpose of furnishing better accommodation to this and other departments, and re-named Agricultural Hall. The quarters now occupied by the Station, (since about September 15, 1884) give it more than twice the office room and fully three times the labratory room which it previously had, and are pleasant, commodious, and well suited for its use.

The cost of these changes in the building, and of the equipment of the rooms with book cases, laboratory tables, shelving, stoves, gas and water to the full extent desired by officers of the Station has been borne entirely by the University, no part of it having been charged to the account of the Experiment Station, and the latter now occupies the rooms free of all charge for rent, fuel, gas or janitorship.

Management of the Farm. The work of an experiment station is to make experiments. To make experiments successfully requires not only knowledge and skill, but also that the experimenter have sufficient time to plan his experiments carefully and to supervise them constantly and effectively. This, if either numerous or elaborate experiments are to be made, is obviously incompatible with giving the requisite personal attention to the many details of the work and business management of a large farm. For this reason, no less than because a farm devoted to experiment can seldom be made profitable, we believe it to be desirable, if not essential, that the amount of ordinary farm work to be done on such a farm be made as small as possible, and the care of its business interests be made as light a burden as is compatible with the proper performance of the station's legitimate work, viz., experimenting.

In accordance with this belief it has been and is our policy to manage the Station farm strictly as a farm for experimental purposes, and for these it is well adapted. The area

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of tilled land is being gradually reduced by seeding to the amount which is required for field experiments with varieties, fertilizers, tile draining, etc. The herd is being improved by sales and purchases, so that it may furnish at all times suitable animals for experiments upon milk and butter production. When the changes now in progress shall have been fully carried out, the main portion of the farm work will consist in haying, and the care of pastures and stock, and all remaining money and energy will be devoted to experimental work. A certain amount of farm work is necessary, but the less the proportion of such work and the greater that of experimental work which a station does, the better is it fulfilling the purpose for which it was created.

Bulletins — For the purpose of bringing the results obtained at the Station before the public as promptly as possible, bulletins are issued from time to time, as material accumulates.

During 1884 three such bulletins hav e been issued, aggregating thirty-eight printed pages of the size of this report. They were: No. 2, "Amount and Condition of Seed Corn in Wisconsin," issued in April; No. 3, "Composition and Digestibility of Fodders," issued in June; No. 4, "Experiments on Milk Production," issued in October.

These bulletins have been widely circulated in all parts of the state and have been distributed to kindred institutions in other states in exchange for their publications.

Exchanges — As just stated, the Station sends its publications to other stations and agricultural colleges, boards of agriculture, etc., in exchange for theirs. It has also arranged to exchange with the leading agricultural papers of the country, and now receives regularly from the publishers and keeps on file in its office the following papers:

New England Farmer, Boston, Mass.
New England Homestead, Springfield, Mass.
Connecticut Farmer, Hartford, Conn.
Country Gentleman, Albany, N. Y.
Rural New Yorker, New York, N. Y.
American Dairyman, New York, N. Y.

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American Agriculturist, New York, N. Y.
Husbandman, Elmira, N. Y.
American Rural Home, Rochester, N. Y.
Farm Journal, Philadelphia, Pa.
American Grange Bulletin, Cincinnati, Ohio.
Farm and Fireside, Springfield, Ohio.
Indiana Farmer, Indianapolis, Ind.
Jersey Bulletin, Indianapolis, Ind.
National Live Stock Journal, Chicago, Ill.
Breeder's Gazette, Chicago, Ill.
Prairie Farmer, Chicago, Ill.
Western Rural, Chicago, Ill.
Farmer's Review, Chicago, Ill.
Colman's Rural World, St. Louis, Mo.
Industrialist, Manhattan, Kan.
Weekly Statesman, Boise City, Idaho.
Sugar Bowl, New Orleans, La.
Western Farmer, Madison, Wis.
Hoard's Dairyman, Fort Atkinson, Wis.
United States Miller, Milwaukee, Wis.

Kinds of Work Undertaken— The purpose of the Station may be stated to be, in general terms, the promotion of agriculture by scientific investigation and experiment.

In pursuance of this purpose it undertakes two kinds of work:

First, it plans and executes, in field, barn and laboratory, experiments designed to increase our knowledge of the laws and conditions of plant and animal growth, and to aid in making profitable application of them in practice. It takes up such questions as the comparative value of different fodders, and their proper combination to form economical rations for various purposes; the relative value of various fertilizers for particular crops; the suitableness of new varieties of plants for our conditions; and many other similar matters which are of general interest to all farmers. Work of this sort it regards as its most important occupation, and to it it hopes to devote the larger share of its energies.

Second, in addition to work of general interest, the Sta-

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tion will seek to aid the individual farmer in solving questions which especially interest him. It is prepared to analyze fertilizers, fodders, milk, soils, etc.; to test farm and garden seeds as to purity and vitality; to identify grasses, weeds, fungi (rusts, smuts, mildews, etc.), and noxious and beneficial insects; and in general to do all work proper to an experiment station, for the use and advantage of the citizens of Wisconsin.

Work of this character will be undertaken for citizens of this state free of charge on condition:

1. That samples are taken in accordance with the Station's instructions, which will be sent on application.

2. That the results are likely to be of use to the public.

3. That the Station has full liberty to publish the results obtained or otherwise use them at its discretion.

In cases where these conditions are not complied with, a moderate charge will be made. The Station, however, distinctly reserves the right to use at its discretion, for the public benefit, all results obtained by it, and in no case will enter into any privacy that can work against the public good.

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CORN-STALKS COMPARED WITH MIXED HAY AND CLOVER HAY FOR PRODUCING MILK AND BUTTER.

BY W. A. HENRY.

The following described experiments were conducted to ascertain:

1st. The relative values of corn fodder and mixed hay for producing milk and butter.

2d. The relative values of corn fodder and clover hay for producing milk and butter.

3d. The amount of milk and butter an acre of corn will make when fed to milch cows.

4th. The value of an acre of corn when turned into milk and butter.

All the materials fed were good of their kind, the corn-stalks being from a lot described further on, cut early, and well cured in the shock and bound into bundles, after husking the fully matured ears. The mixed hay was about one third clover and two thirds timothy. The clover hay was from medium red clover, cut early enough to preserve the leaves and heads in good condition. The corn-meal was from Kansas corn, thoroughly dried and ground fine. The bran was Minneapolis new process.

The hay and fodder were fed long, thus necessitating much waste with the corn-stalks, which might have been avoided by running the stalks through a cutter, but as this was a preliminary trial, it was deemed best to take each fodder in its simplest form, leaving other tests to show us the loss by feeding in this way.

Four excellent butter cows were selected and divided into two lots of two each, of equal capacity for producing milk and butter as near as we could judge. During the trials they held their weights and maintained their appetites so well that no further mention need be made of these points.

In every trial a week's preliminary feeding preceded the two weeks of actual test, this time being considered neces-

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sary for accustoming the animals to their diet, and to get the full effect of the food on the milk.

In the first trial the ration of Lot 1 was five pounds of corn meal and seven pounds of bran per cow daily, in two feeds, fed dry, and as many corn stalks as they would strip of the softer, finer parts. The ration for Lot II was the same as that of Lot I, except for the corn-stalks mixed hay was substituted, a full supply being kept before them. After feeding carefully for a week the ration was continued and the milk and butter product saved for fourteen days. At the end of this period the hay and corn-stalks of the two rations were changed about for the two lots and the trial repeated. The two cows of each lot, therefore, were on both sides of the trial, thus eliminating largely the errors due to the difference in individuals.

Six weeks were required to complete the test with mixed hay and corn-stalks, and, this done, the whole trial was repeated except that clover hay was substituted for the mixed hay, the corn-stalk ration being continued.

The tables here given show in a condensed form the results:

FIRST TRIAL—CORNSTALKS VERSUS MIXED HAY.

Two cows in each lot; each period 14 days.

	Numbers of the cows of Lots I and II.	Amount of corn-stalks fed.	Amount of mixed hay fed.	Refuse weighed back.	Amount of corn-stalks eaten.	Amount of hay eaten.	Amount of corn meal eaten.	Amount of bran eaten.	Amount of milk given.	Amount of butter made.
		lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.oz.	lbs.oz.
First period, Jan. 9–25.	1 & 2	1186	.....	436	750	.....	140	196	640.9	29.13½
	3 & 4	.....	800	26½	.....	278½	140	196	480.8	28.10½
Second period, Feb. 4–18.....	1 & 2	.....	455	11	.....	444	140	196	583.7	27.7
	3 & 4	1188	.....	367½	820½	.....	140	196	490.3	27.3

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SECOND TRIAL—CORNSTALKS VERSUS CLOVER HAY.

Two cows in each lot; each period 14 days.

	Numbers of the cows of Lots I and II.	Amount of cornstalks fed.	Amount of clover hay fed.	Refuse weighed back.	Amount of cornstalks eaten.	Amount of clover hay eaten.	Amount of corn meal eaten.	Amount of bran eaten.	Amount of milk given.	Amount of butter made.
		lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.oz.	lbs.oz.
First period, Feb'y 26–Mch. 11...	1 & 2	922½	.....	348	574½	.....	140	196	607.13	25.12
	3 & 4	.....	366	49½	.....	316½	140	196	497.13	25.8
Second period, Mch. 19–Apr. 1.	1 & 2	.....	276½	19	.....	257	140	196	561.4	29.6½
	3 & 4	944½	.....	298½	646	.....	140	196	471.6	26.6½

Comparing cornstalks with the mixed hay, when supplemented by 280 lbs. of corn meal and 392 lbs. of bran, we find—

2,374 lbs. of cornstalks yield 1,120 lbs. 12 oz. milk, making 57 lbs. 0½ oz. butter;

755 lbs. of mixed hay yield 1,063 lbs. 15 oz. milk, making 56 lbs. 1½ oz butter;

or, 56 lbs. 13 oz. milk and 15 oz. of butter more from the stalks than from the mixed hay.

Comparing cornstalks with clover hay, as in the previous instance, we find—

1,867 lbs. cornstalks yield 1,079 lbs. 3 oz. milk, making 52 lbs. 2½ oz. butter;

642½ lbs. clover hay yield 1,059 lbs. 1 oz. milk, making 54 lbs. 8½ oz. butter;

or, 20 lbs. 2 oz. more milk, and 2 lbs. 6 oz. less butter from the cornstalks than from the clover hay.

Taking into consideration the fact that the milk and butter yield are both larger from the stalks than from the mixed hay it is fair to say that the cornstalks were worth one-third as much as the mixed hay; that is, one ton of mixed hay is worth three tons of stalks fed as these were.

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From the second trial we see that one ton of clover hay was worth somewhat more than three tons of cornstalks fed as described.

In the two trials 4,241 pounds of stalks were fed, and 1,450 pounds weighed back as coarse parts that the cows refused to eat. This is over 34 per cent. of the whole amount of the stalks, by weight, lost by feeding in this manner. Whether the part thus lost is proportionally as valuable as that eaten, and what amount can be saved by passing the stalks through a feed cutter is work for future experiments.

Arranging our figures in another form we have the following:

Food required for 100 pounds of milk when feeding cornstalks:
- 193 pounds of cornstalks.
- 25 pounds of corn meal.
- 35 pounds of wheat bran.

Food required for 100 pounds of butter when feeding cornstalks:
- 8,880 pounds of cornstalks.
- 514 pounds of corn meal.
- 719 pounds of wheat bran.

Food required for 100 pounds of milk when feeding mixed hay:
- 71 pounds of mixed hay.
- 26 pounds of corn meal.
- 36 pounds of wheat bran.

Food required for 100 pounds of butter when feeding mixed hay:
- 1,348 pounds of mixed hay.
- 500 pounds of corn meal.
- 700 pounds of wheat bran.

Food required for 100 pounds of milk when feeding clover hay:
- 60 pounds of clover hay.
- 26 pounds of corn meal.
- 37 pounds of wheat bran.

Food required for 100 pounds of butter when feeding clover hay:
- 1,179 pounds of clover hay.
- 513 pounds of corn meal.
- 718 pounds of wheat bran.

From the data here given one can easily calculate the cost of food necessary to produce one hundred pounds of milk or butter. Supposing hay is worth $8 per ton; then the cornstalks would be worth $2.66, or one third the value of the

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hay, as shown by these experiments. Suppose further, that bran can be had for $12, and corn meal for $15 per ton. Assuming these prices we will find that the food necessary to produce one hundred pounds of milk costs, as the average of the before detailed experiments, about sixty-six cents, and the food to produce one hundred pounds of butter costs about $12.84.

In considering these experiments the reader should bear in mind that during each of the four periods lasting three weeks each, including the week of preliminary feeding, the cows were upon one variety of food, and that only. Variety in food is as essential to beast as to man, if we wish the best results, and these results may be looked upon as the lowest we should receive from these food articles, rather than average or high results. Any careful feeder of dairy cows has observed that the cow is the quickest of all animals on the farm to appreciate and respond to variety and a change of diet from time to time.

The cornstalks used in these experiments were from a plot of ground 3.27 acres in area. This corn was grown upon tile drained land that in former years had been of little value owing to crops drowning out almost every year.

The corn was of the Pride of the North variety, a small stalked, small eared, early yellow dent corn. The 3.27 acres produced 14,684 pounds of stalks and 16,160 pounds of ears, or 4,490 pounds of stalks and 4,941 pounds of ears of corn per acre. This was 68 bushels of 72 pounds each.

With these facts and those of the experiments before us, let us attempt to estimate the butter that can be produced from an acre of our corn land.

For this purpose let us assume that the 4,491 pounds of ears from an acre would make 4,000 pounds of corn meal, allowing for shrinkage and grinding about twenty per cent. which is fully enough for corn as dry as this at husking.

Now most farmers would be unwilling to trade a ton of corn meal for a ton of bran, but let us substitute bran for corn meal, pound for pound in part, so as to have seven pounds of bran for each five of corn meal. The two tons of

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corn meal then would give us 2,334 pounds of bran and 1,666 pounds of corn meal.

By our experiments we have shown that by feeding as described, 193 pounds of cornstalks made 100 pounds of milk and for 100 pounds of butter 3,874 pounds were required; also that 25 pounds of corn meal and 35 of bran were required in addition to the cornstalks for 100 pounds of milk, and 514 pounds of meal and 718 pounds of bran for 100 pounds of butter.

From this we see that an acre of land produced sufficient grain food for 6,664 pounds of milk, or 324 pounds of butter, and sufficient cornstalks for 2,324 pounds of milk or 115 pounds of butter.

Valuing milk at $1.00 per 100 pounds and butter at 20 cents per pound (winter prices) we find that one acre of land produced sufficient corn stalks for $23.24 worth of milk, or $23.00 worth of butter, and meal sufficient for $66.64 worth of milk, or $64.88 worth of butter.

It will be noticed that about three acres of corn stalks are necessary to supplement the corn from one acre, as we fed it. Practically the farmer can grow hay in part for coarse feed, thus giving variety and maintaining the balance between crops so essential in successful farming.

During the coming winter it is designed to continue experiments in this direction, using the feed cutter to reduce the corn stalks to a condition in which they can all, or nearly all, be eaten.

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EXPERIMENTS IN SETTING MILK.

BY W. A. HENRY.

Complaints have occasionally come to the Station by parties, that they have tried deep setting but gave it up because they got less butter by this method than with shallow pans. Investigation usually shows that proper attention has not been paid to the temperature of the water in the tank in such cases. While the temperature of melting ice is 32 degrees Fahrenheit, a tank of water with cans of milk in it and broken pieces of ice floating at the top will stand in summer weather at from 35 to 42 degrees. Where no ice is used the water of the tank is soon warmed by the heat from the milk, and the conditions are soon changed from what they were when the milk was set. To determine accurately the best temperature to maintain in the tanks and what the loss is for every change or variation from the standard, is perhaps an impossible problem, at least it is a difficult one, but it was deemed important to make some trials for our own information on this subject. Two Cooley tanks were used. An equal quantity of mixed milk was set in Cooley cans in each of the tanks. The water of each tank was held with but little variation at a definite temperature, by varying the amount of ice used. One tank was held at 40 degrees, the other at 45; then again one at 45 and the other at 50, and on a third trial one was held at 45 and the second at 55 degrees.

At the end of eleven hours from the time of setting each can was skimmed and in due course of time butter made. Each single setting and its product of butter was kept by itself.

The tables here given show the amounts of milk set at each test. The temperature and the amount of butter made from each lot of milk. In the last column is the percentage of loss resulting from the higher temperature.

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TEMPERATURE AT WHICH MILK WAS SET.	Amount of milk set.		Amount of butter churned.		Per cent. lost by high temperature.
Degree Fahrenheit.	Lbs.	Oz.	Lbs.	Oz.	
40	101	14	4	8	.....
45	101	14	4	6	2.7
40	109	6	4	12½	.....
45	109	6	4	9½	4.5
40	95	4	4	8½	.....
45	95	4	4	5	4.8
40	94	8	4	1½	.....
45	94	8	3	14	5.3
40	87	8	4	0	.....
45	87	8	3	14	3.1
45	92	12	4	5	.....
50	92	12	4	0	7.2
45	88	4	4	0	.....
50	88	4	3	10	9.3
45	96	4	4	9	.....
50	96	4	4	2½	8.9
45	77	8	3	6½	.....
50	77	8	3	1	10.0
45	76	0	3	4	.....
50	76	0	3	1	5.7
45	67	0	3	4	.....
50	67	0	3	2	3.8
45	70	0	3	5	.....
55	70	0	2	5	30.0
45	73	0	2	15	.....
55	73	0	2	4	23.4
45	68	0	3	3	.....
55	68	0	2	11	15.6
45	80	4	3	8	.....
55	80	4	2	14½	16.9
45	88	0	3	14	.....
55	88	0	2	15½	23.3
45	73	8	3	14	.....
55	73	8	3	4	16.1

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During these trials analyses were made of the skim milk from the cans set at forty degrees, and the determinations show that the fat left in the milk ranged from thirty-one hundredths to forty-four hundredths of one per cent. The full milk contained about four and five tenths per cent. of fat or four and a half pounds of butter in one hundred of milk, and the analyses showed that from three to four tenths of a pound of butter remained upon skimming at the end of eleven hours from setting in the tank of water held at forty degrees.

This is skimming about as close as is practicable by any system, except the centrifugal separators, with mixed milk, though in one instance where the milk of a Jersey cow was set by itself as described above, only twelve one hundredths of one per cent. in one trial and eight one hundredths of one per cent., in another trial, of the fat remained, though there was nearly five per cent. of fat in the full milk.

It is safe to say that milk set in deep, narrow cans, in a tank of water with plenty of fine ice floating in it, will throw up about all the cream obtainable in eleven hours.

When the quantity of ice is small and the weather very warm so that the water runs up to forty-five degrees, the loss may run from 2.7 per cent. to 5.3.

Setting at fifty degrees as compared with forty-five shows a loss of from 3.8 to 10 per cent., and fifty-five degrees shows that the range of loss is from 15.6 to 30 per cent. over that set at forty-five degrees.

Many farmers in this state attempt to follow deep setting and provide a tank and cans, but use well water and refill the tank occasionally, or possibly not at all. Others allow a stream to run continuously through the tank, provided the windmill furnishes the water.

To offset losses such persons usually skim at the end of 24 hours instead of at the next milking. In this way the loss of cream is no doubt lessened, but there must be serious losses in many instances despite the delayed skimming.

Milk drawn from the cans eleven hours after the cans are plunged into ice water is yet fully sweet and valuable for

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feeding to calves. This one point alone is sufficient to commend the system to our farmers for more general adoption. If adopted, however, it should be well understood that attention to the temperature of the tank of water is essential to the highest success.

There are parties who object to deep setting. Good butter can be made in several ways without any doubt. Deep setting commends itself, however; it is inexpensive, saves labor, gives uniform results and leaves the skim milk in its most valuable condition. Thousands of our dairymen are making butter by this system and by the price obtained are satisfied with it.

DELAYED SETTING OF MILK.

At the Experimental Farm the milk is strained immediately upon milking into Cooley cans which are 8½ inches in diameter and 20 inches deep, and these cans containing the warm milk are plunged into water with ice floating in it. Noticing that the dairyman was not always prompt in placing the cans of milk in the water, I thought it wise to test and see if any loss resulted from the delay. Accordingly, upon milking, the milk was strained into a large can, carefully mixed and divided into two equal parts, and poured into the Cooley cans. Cans holding one-half of the milk were plunged into the ice water at once, and the others were allowed to stand out of doors for some time and then placed beside the others in the water tank. In the table herewith given the following points are noted: The amount of milk set; the temperature of the air in which the cans of milk of the delayed setting were allowed to stand; the temperature of the milk of each lot at time of setting, and the butter made from each lot, and the per cent. of loss by delaying the setting. In the last trial the temperature of the air was not reported.

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NUMBER.	Amount of milk set.	Temperature of the atmosphere.	Time lot II stood in open air.	Temperature of milk when set.	Amount of butter churned.	Per cent. of loss from delaying the setting.
	lbs.	F'ht.	Min.	F'ht.	lbs. oz.	
I	52	.....	.....	91°	2 12	.....
II	52	19°	20	86°	2 9½	5.7
I	41	.....	.....	91°	2 5	.....
II	41	30°	25	80°	2 1½	9.4
I	51	.....	.....	93°	2 13	.....
II	51	28°	25	86°	2 11	4.4
I	51	.....	.....	91°	2 6½	.....
II	51	28°	30	78°	2 4½	5.2
I	50	.....	.....	93°	3 1	.....
II	50	.....	30	82°	2 13	8.1

It will be seen that the loss runs from four to more than nine per cent. of the butter made. This is quite significant and points clearly that to avoid loss the cans of milk should go to the water tank at once. Of course no dairyman would think of allowing cans of milk ordinarily to stand so long as they did in these trials, yet in the hurry to get to breakfast they are apt to be overlooked occasionally.

WARMING UP THE MILK BEFORE SETTING.

But if butter is lost by cooling the milk as before shown may there not be a gain by warming it up before plunging it into the ice water? Such a query arises upon reading the previous account. To test this the milk was divided as before and one half heated to either 110 or 120 degrees Fahrenheit, and the other half plunged into the tank at once.

The results are here tabulated.

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NUMBER.	Amount of milk set.	Temperature of milk when set.	Amount of butter churned.	Loss by heating the milk.
	lbs.	Degrees Fahr.	lbs. oz.	
I.	41	91	2 5	.....
II.	41	110	2 2½	6.7
I.	46	90	2 5	.....
II.	46	110	2 3½	4.0
I.	42	90	2 9	.....
II.	42	110	2 5½	8.5
I.	46	91	3 0½	.....
II.	46	120	2 10½	12.3
I.	41½	89	2 7	.....
II.	41½	120	2 7	0
I.	46	90	2 10½	.....
II.	46	120	2 7	8.2

An examination of the results shows no advantage in heating the fresh milk to 110° or 120° but in every instance but one there was a loss ranging from 4 to over 12 per cent.

It is true these are not very extended tests, but there would appear to be no encouragement in carrying them further unless to show more accurately the losses.

These together with the preceding trials show plainly that with deep setting the milk should be set as soon as possible and that the natural heat of the milk is all-sufficient to throw up the maximum amount of cream between milkings when the cans are plunged into ice-water.

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THE SCHOCH & BOLENDER TEST CHURN.

By W. A. HENRY.

One of the causes that brought the cream-gathering system into operation, was the desire to have the skim-milk left upon the farm for feeding purposes, and to have all the labor of making and caring for the butter centered in competent parties. These facts make the system a desirable one in many localities; but, to secure to each patron his just dues, has been one of the ever present difficulties. The amount of cream necessary for a pound of butter at one farm house, might make a pound and a half at the next, even when both parties were honest; and, of course, when deception is practiced, the variations may be still greater. To have a means of testing what may be called the butter power of cream, Messrs. Schoch & Bolender, of Orangeville, Illinois, invented a series of test churns for testing samples of cream. This test churn is a table which can be made to move rapidly back and forth, by hand or other power, on which are fastened from four to sixteen glass jars, lying horizontally. It is designed to fill these jars about half full with the cream to be tested, and so churn several samples at once, and all under the same conditions.

At the experiment Station we have endeavored to test this compound churn to see if results practically uniform, could be secured. To this end comparisons were instituted among the small churns themselves, and again between these and a large churn.

From a lot of cream, thoroughly stirred, four samples, of two pounds each, were placed in the four test churns, and the remainder of the cream churned as usual in a rectangular churn. The cream in the test churns was churned at the same temperature as that in the large churn, and the butter carefully collected, washed, gathered and weighed. The accompanying table shows the result of five churnings in this way. In this table is given the amount of cream in the large churn, the time required for churning, and the

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number of grams of butter obtained; also the same facts for each of the small churns, and in the last three columns that which will be of most interest, the comparative results.

DATE.	RECTANGULAR CHURN.			TEST CHURN.						COMPARI'N OF THE 2 CHURNS			
	No. minutes to churn.	Pounds of cream.	Weight of butter obtained in grams.	No. minutes to churn.	Pounds of cream.	Grams of butter in churn No. 1.	Grams of butter in churn No. 2.	Grams of butter in churn No. 3.	Grams of butter in churn No. 4.	Grams of butter from 1 lb. cream by Rect'lar.	Grams of butter from 1 lb cream by Test ch'n	Per cent of loss by Test churn.	Greatest per cent. of extreme variation between the Test churns.
May 22	20	30½	2,849	10	2	184	185	182	184	94⅛	91⅞	2.6	1.6
26	40	33⅞	2,697	20	2	156	158	158	156	79⅝	78½	1.7	1.2
28	45	78½	5,916	30	2	146	148	150	148	75½	74	1.7	2.7
31	40	74	6,095	15	2	166	165	165	165	84⅓	82⅜	2.4	0.6
June 3	40	69	5,953	15	2	167	170	169	167	86½	84⅛	2.5	1.8

Since our butter scales weighed only to the half ounce, a more delicate scale weighing to grams,* was used for determining the amount of butter. I have not thought it worth while to change the figures to ounces and fractions, as the results are only comparative. It will be seen that the results with the small churns were quite even; thus on May 26th two of the small churns gave 156 and two 158 grams of butter; on the 31st three gave 165 grams and one 166. It should be here remarked that such small variations are within the limits of error in butter making, as with such amounts a careful person might vary as much as five per cent. in results, through working out more or less of the water, and the small losses that necessarily occur. The very last column of the table shows the extreme variations among the test churns themselves go from as low as 0.6 to 2.7 per cent. These results are, I consider, perfectly satisfactory. Practically this shows, that had four neighbors who happened to have exactly similar cream, had it tested they

*A gram is about one twenty-eighth of an ounce.

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would all have been rated within three per cent. of one another.

As to the comparison between the small and large churns, we note that a pound of cream in the rectangular churn always gave a higher yield than the test churns. In the next to the last column of the table, the difference is shown to run up as high as 2.6 per cent. in favor of the large churn. In this we see that the factory would get a little more butter in total than it would give its patrons credit for in severalty. But the error is again small, and the variations are less than one per cent. between extremes. These, and other tests, show the churn, under proper management, to be reliable and proper for the purpose intended.

THE VALUE OF THE DROPPINGS OF CORN-FED STEERS FOR HOGS.

BY W. A. HENRY.

The practice of placing hogs with steers feeding on corn, in order to save the waste in the droppings of steers is a common one at the West and practiced by our most successful stockmen. That hogs, if not too numerous, will thrive with little or no extra feed, when running with steers that are heavily grained, is a well known fact and a large amount of food otherwise wasted can be saved by this means. The figures here given show the results of one short trial of feeding in this way made in the spring of 1885.

Two steers, coming two years old, running in a small yard having access to a room in the stock barn for shelter, were fed shelled corn and cornstalks; two hogs were placed with these and, in addition to the droppings of the steers, received sufficient corn to keep them quiet. In similar quarters two other hogs of the same condition were placed and received similar treatment, except that they were alone; they were also fed corn enough to keep them quiet. Ten days preliminary feeding preceded the trial in order to accustom the

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animals to their feed and quarters. Since steers vary greatly in weight from day to day, the average of two days weighings was taken as the weight of the lot at the beginning and close of the trial.

	Weight March 24.	Weight April 7.	Gain in 14 days.	Amount of corn eaten.	Amount of fodder eaten.	Amount of corn for 1 lb. of growth.	Amount of fodder for 1 lb. of growth.
	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
Two steers.....	1,691	1,721½	30½	328	115	10.7	3.4
Two hogs with steers..	439	470	31	105	.....	3.4	.....
Two hogs alone.....	435	480	45	233	.....	5.17	.....

By this table we see that the steers required 10.7 pounds of corn for one pound of gain, or less than six pounds of gain from a bushel of corn. The amount of corn required is excessive by from two to four pounds for one of gain, for with the fodder consumed eight pounds of corn should have sufficed as the maximum amount for a pound of gain. The food lost in the steers is partly recovered, however, by the hogs running with them, where only 3.4 pounds of corn were required for a pound of gain, while the hogs, kept separate, required over five pounds of corn for one of growth.

Putting it in another way: a bushel of shelled corn made 11.4 pounds of pork when fed alone to hogs, while a bushel fed to hogs running with corn-fed steers made, with the help of the droppings of the steers, 17.6 pounds, or over one half more.

It would be interesting to know the value of the droppings for hog feed had the steers made a better gain from the food given.

More experimental work is needed in this line to show whether by feeding meal instead of whole grain the gain per pound of food can be materially increased, and if the

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droppings of meal fed steers is equally valuable for hogs as that from whole grain.

I am of the opinion that it is more economical to feed shock corn and place hogs with the steers running under open sheds than to husk and grind the corn and feed in stalls. The labor problem is often a more serious one than economizing food articles, and if we are to compete at all with the great cattle regions to the west of us we must turn off a maximum quantity of beef from our farms of high quality at the lowest possible price. To husk corn, draw to mill, pay for grinding, and draw back again, is labor of doubtful profit in steer feeding in these days in Wisconsin. I believe steers will gain rapidly on whole corn in the husk, and that young growing hogs will save so much of the undigested corn that this method of feeding is superior to any other now practiced.

FEEDING BUNTY WHEAT SCREENINGS.

BY W. A. HENRY.

The following letter explains itself:

CLINTON, WIS., December 31, 1884.

PROF. W. A. HENRY, Madison, Wis.:

Dear Sir:— I send by mail a little bag of screenings taken from a car load of wheat that I raised in Dakota and had shipped here. There are nearly two tons like the sample, very smutty. I remember that you made some experiments with corn smut. I send this to get your views as to the wisdom of grinding and feeding to fatting steers such feed, either clear or mixed with corn, barley or bran. I should of course run this through a mill again, and get out the worst of it, but there would still remain no small amount of the smut. I suppose that in any event it would not be safe to feed it to pregnant females. Respectfully yours,

D. G. CHEEVER.

An examination of the sample showed a mixed lot of grains such as often come from the west.

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A portion of the sample was examined, and showed the following varieties of seeds.

850 wheat grains—shrunken or broken.
33 barley grains.
11 oat grains.
66 corn cockle (Lychnis githago) seeds.
12 lady's thumb (Polyganum persicaria) seeds.
728 bindweed (Polyganum convolvulus) seeds.
122 bindweed (Polyganum convolvulus) seeds.
5 fox-tail grass (Setaria glauca) seeds.
33 pigeon grass (Setaria viridis) seeds.
1 flax seed,
16 unidentified weed seeds.
126 grains of bunty wheat.

Many of the grains of bunty wheat had broken to pieces and scattered the spores over the other seeds, so that the grain looked as though soot had been sprinkled over it. Having never learned of any troubles arising from grain infested in this way, the following reply was sent:

MADISON, WIS., January 2, 1885.

D. G. CHEEVER, ESQ., Clinton, Wis.:

Dear Sir—In reply to yours of 31st ult., regarding the sample of smutty (bunty) screenings sent, I will say that I should go ahead and feed the same to steers, after cleaning it as much as I could conveniently. Should mix it with other food as you propose to do. No harm will come in all probability, and the amount of food matter in two tons of such material is too much to throw away without good cause. By screening it carefully, you will be able to blow out most of the "bunty" kernels, as you will readily see by placing a sample of the grain on a sheet of paper and blowing gently so as to carry the lighter grains away.

Please inform me of the results when through, as such questions come to us every now and then, and facts are worth more than theory.

Most truly yours,

W. A. HENRY.

Fed with other grain, no harm resulted, as the following letter in reply to request for results of the trial shows:

CLINTON, ROCK COUNTY, WIS., April 14, 1885.

DEAR SIR:—Agreeably to your request I would report results of my feeding the smutty screenings. I mixed about half of corn meal, barley meal, bran, and whatever I had on hand with the said screenings. The

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stock ate it with a relish and seemed to thrive as well as when eating other feed. I saw no signs of any derangement of their systems while consuming it. Respectfully yours, D. G. CHEEVER.

GRASSES FOR HAY AND PERMANENT PASTURE.

BY W. A. HENRY.

So naturally does Blue grass grow in Wisconsin, and so easily do Timothy and Red clover catch from seeding with spring grain, and so valuable are these three grand forage plants that our farmers have come to look upon them as being the sum total of all that are valuable for hay and pasture, and one scarcely ever hears any inquiries as to the value of other varieties.

At the Ontario Agricultural College, Guelph, Canada, Professor Brown has been experimenting with mixtures of grasses of numerous varieties for permanent pasture, and his results are not only satisfactory to himself, but enterprising farmers have taken up the idea and are reporting excellent results.

At this Station last spring upon a lot of about four acres, the following varieties of grass and clover seed were sown:

Grass.	*Per acre.*
Timothy	7 pounds.
Orchard	4 "
Italian rye	2 "
Perennial rye	2 "
Tall oat	2 "
Red top	2 "
Kentucky blue	2 "
Clovers.	
Alfalfa	4 "
White	1 "
Alsike	1 "
Red	2 "
Total sowed per acre	29 pounds.

The seeds were sown early in May upon spring plowing, harrowed down fine. One part of the lot was sown with a light seeding of barley in addition to the grass seed, and the

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remainder of the lot was seeded with the grasses and clovers alone. An excellent "catch" was secured. Some weeds came up with the grass sowed alone, but in spite of these this part of the field flourished in a most surprising manner, while that with the barley grew spindling and pale. Under favorable skies, that with the barley did well after the barley was cut, but to the close of the season one could see the line between the two lots. So heavy was the growth where seeded alone, that from two and a third acres 6,198 pounds of hay were taken. True, there were some weeds in this hay, but aside from these the yield was fully one ton of fine mixed hay to the acre. From the barley seeded portion no hay was cut. Checked by the mowing, the grass growing by itself formed a dense mat, and furnished a fine pasture during the fall for several weeks. This portion of the pasture were worth not less than $2.00 per acre, with stock at 25 cents per head, per week. That where the barley was sown was worth about half this amount. Counting the hay worth $8.00 per ton, a total value of $10 per acre was removed the first season by seeding alone with mixed grasses. It will take time to develop all the facts in this case, but I am confident that a mixed pasture of this kind will be worth $3 per acre more each year than the common Timothy and Clover sod. Not only is more grass grown but the cattle are furnished a variety and a succession during the season. It is quite probable that some of these varieties will not remain permanently, but be driven out by other varieties. Such facts will be watched and reported.

Of one of the varieties of the list here given, more should be said in this connection. Orchard grass will prove a valuble addition to Wisconsin meadows and pastures, without doubt. It is hardy, very vigorous, and starts very early in the spring and holds late in the fall. On the tenth day of last May in a sod of Blue grass on the University grounds where the leaves were two and a half inches high, stood tufts of Orchard grass with the broad green leaves standing up full ten inches high. Any grass that shows such a growth in spring and is sweet and nutritious cannot fail being of importance in a state where the winters are so long

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as they are with us. Orchard grass seed should be sown with other grasses, as a rule, since it naturally grows in tufts or tussocks and does not form a uniform smooth sod like Blue grass. The amount of seed may vary with the wishes of the sower from a few quarts in a mixture with other grasses to two bushels per acre, if sown alone.

Any dealer in seeds can supply Orchard grass upon application.

NOTE.— Since the above was written we have found that the past winter was very severe upon Orchard grass. Wishing for more light a letter was sent to Hon. F. A. Hoffman, Jefferson, Wis., asking for his experience. Herewith is his reply:

JEFFERSON, WIS., June 6, 1885.

MY DEAR SIR: — Orchard-grass I have found to be superior to any other variety as a pasture grass. As a meadow-grass it is inferior to many other varieties. Want of time precludes the possibility of entering into particulars; I must, however, add that I have grave fears as regards the power of Orchard-grass to withstand the severity of our winters. The ast, as well as the previous winter proved rather hard on Orchard-grass.

Most cordially yours,

F. A. HOFFMAN.

It was not killed out so badly with us as Red clover last winter, yet persons should, in view of possible loss, sow Orchard-grass with caution until we learn by years of experience its hardiness.

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THE COMPARATIVE VALUES OF SEVERAL NEW VARIETIES OF SORGHUM.

BY W. A. HENRY.

In 1883 Professor Peter Collier, chemist to the Department of Agriculture, Washington, sent to us a large number of varieties of sorghum seed to be planted and tested. Unfortunately, just after planting a severe storm washed out the seed of many varieties and covered others so deep with earth that the trial was abandoned.

It happened however, that of some of the varieties a little seed remained unplanted, and in 1884 this was used with better results.

The seed was planted in drills and the growing plants treated as for manufacture into syrup or sugar. The canes were cut for analysis October 13th and 20th, before any frost had affected them. Three stalks of each variety were taken, the lower joints cut fine and the juice expressed in a hand press.

In the table here presented are given the names of the varieties sent direct from Africa, having the native names as sent by Professor Collier. Two varieties are from India and four are from seed grown in this country. In addition to the varieties sent by Professor Collier, the next to the last on the list is from seed kindly sent by Mr. Seth H. Kenney, Morristown, Minnesota, and the last variety is from seed sent out by the Department of Agriculture last season.

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Jersey Cow, HAZEN'S BESS. Property of CHURCHMAN & JACKSON, Beech Grove, Indiana.

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NAME OF VARIETY.	Locality from whence the seed came.	Condition of seed at time of the test.	Sucrose.	Glucose.	Total.	Height of Canes.	Weight of three canes gross.	Weight of three canes stripped and topped.
						Feet.	Lbs.	Lbs.
Ukubane	Natal, South Africa	Ripe	0.979	Trace.	0.979	7	4¼	3
Oyenga	Natal, South Africa	Ripe	11.37	3.95	15.32	11½	6¼	5
Jyargentombi	Natal, South Africa	In milk	7.09	2.57	9.66	7½	6¼	4½
Ibohla	Natal, South Africa	Dough	5.49	4.22	9.71	13	8	6¼
Dindemuka	Natal, South Africa	Ripe	6.27	1.45	7.72	9	6¼	5
Uboyana	Natal, South Africa	Very green	4.48	2.98	7.46	9	6¼	5¼
Undendebule	Natal, South Africa	Dough	11.42	1.95	13.37	11	6¼	4½
Ihlosa	Natal, South Africa	In milk	8.58	2.24	10.82	10	7	5
?	Natal, South Africa	In milk	7.59	6.43	14.02	11	6¼	5¼
Unkunjana	Natal, South Africa	Ripe	7.14	1.68	8.82	10	5¼	4
Ufatane	Natal, South Africa	In milk	12.71	2.90	15.61	11	7½	5¼
Hlogonde	Natal, South Africa	In milk	6.77	3.85	10.62	10	7½	6
Ufatane	Natal, South Africa	In milk	7.59	2.41	10.00	9	7½	5¼
Black Sorgho	Cawnpore, India	Ripe	10.43	0.90	11.33	9	5¼	3¼
Red Sorgho	Cawnpore, India	Ripe	8.03	1.56	9.59	11	5¼	4
White Imphe	United States	Ripe	12.39	1.56	13.95	9	5¼	3¼
White African	United States	Ripe	8.98	1.67	10.65	9½	5¼	3¼
Stump	United States	Ripe	12.77	2.89	15.66	9½	5¼	3½
White Mammoth	United States	Ripe	9.25	2.00	11.25	10	9½	7½
Early Amber	S. H. Kenney	Ripe	13.60	1.04	14.64	10½	6	4
Early Amber	Department Agricul ure	Ripe	14.62	0.90	15.52	8½	4½	4

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The first on the list, the Ukubane, seems to be wholly unfit for syrup or sugar making as it contained less than one per cent. of sugar in the juice. It should be classed with the Douras or Rice corns, and no doubt was grown for the seed and not the juice. The panicle, or head, is about nine inches long, compact and heavily loaded with reddish brown seeds of medium size. The glumes are smaller and paler than the seeds. The heads are really very ornamental, and I judge it worthy of attention in this regard. These heads are very attractive to intermix with sheaves of the cereals in grain decorations and will do for large winter bouquets also.

Tests will be continued with the Oyenga and Ufatine varieties, but the other African, as well as both Indian varieties seem too slow growing or too low in sugar content to merit any further attention. Of the home varieties, the White Imphee, Stump and Early Amber should all receive attention, and will be planted again for further investigation as to syrup and sugar qualities.

It may be said after four seasons' investigations that for syrup and sugar making in Wisconsin, there is no better variety now known to us than the Early Amber. This is one of the first to mature and its juice is very rich in cane sugar.

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GRAIN TRIALS.

BY W. A. HENRY.

WINTER WHEAT FOR 1884.

The Experiment Farm has proved as good a location for growing winter wheat as any in the state, judging from the returns.

Several times the yield has run above fifty bushels per acre. Twice in twelve years there have been total failures, and three or four times the yield has been a little light.

With the small margin of profit there is in wheat-growing, this occasional total loss of the crop makes one hesitate to recommend this crop to our farmers.

The endeavor has been to find a hardy variety that would reduce the poor crops to the fewest possible number and and allow winter wheat to be numbered among the crops that can be considered reliable. The variabilities of our winters when the damage is done, seem however to be an almost insurmountable object in the way of progress. Every few years there occurs a winter when from lack of snow, deep freezing of the dry ground, or coating of ice that smothers the plants, the whole crop goes, and one can hardly hope for an ironclad variety to withstand such severities. Feeling that something should be done by the Station to enlarge our knowledge of this important plant, and finding the hardiest varieties tests were begun in 1882 with several varieties, and have been continued since that date, The wheat yield of 1884 was most satisfactory in every way. The table below shows the results on plots of one twentieth of an acre. For convenience to the reader the rate per acre is given instead of the yield of the plots, as comparisons are easier with that standard than the smaller fraction.

This wheat was sown September 18, 1883, upon carefully prepared land. The whole season, from sowing to harvesting, was favorable to a large crop.

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YIELD OF WINTER WHEAT FOR 1884.

NAME OF WHEAT.	Date of cutting.	Weight of straw per acre.	No. of bushels per acre.	Weight per bushel.
Arnold's Gold Medal	July 17	5,915	42 55/60	59
Champion Amber	14	4,780	55 10/60	58½
Wyson	16	7,700	43 30/60	60
Bennett	16	7,155	38 45/60	61
Finley	12	6,840	52	61
Egyptian	14	7,510	48 10/60	61
Russian No. 2	14	6,480	48 10/60	61
Hungarian White Chaff	15	6,325	40 55/60	62½
Theiss	15	7,475	43 25/60	61
Heiges Prolific	15	6,900	43 20/60	61
Saadomirka	16	7,800	40	61
Ostry	16	7,440	49 20/60	61
Spark's Swamp	16	7,155	40 35/60	60
White Rogers	16	8,000	50 10/60	60
Velvet Chaff	12	7,680	38 40/60	62
Washington Glass	16	7,280	41 20/60	58½
Martin's Amber	16	7,100	41 40/60	60
Hallet's Original Red	16	4,285	37 55/60	55
Sibley's Hybrid Mediterranean	16	6,610	42	58

Experience has shown that the methods practiced in the old winter wheat sections of Western New York are equally valuable with us. The ground should be plowed as early as possible, and reduced to the finest condition attainable by repeated cultivations. The surface soil, say an inch or two deep, should be fit for an onion bed, while that below that depth should be firm, but not hard. A simple breaking and

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continued surface culture gives just this condition. A loose, recently plowed field is in no condition for wheat.

SPRING WHEAT FOR 1884.

The following varieties of wheat were sown April 28, except the last named, which was sown May 10. The seed was sown at the rate of one and three quarters bushels per acre. As with the winter wheat, each plot was one twentieth of an acre in area, but the yields are reported for an acre for the purposes of comparison.

YIELD OF SPRING WHEAT FOR 1884.

NAME OF WHEAT.	Date of cutting.	Weight of straw per acre	No. of bushels per acre.	Weight per bushel.
Grunow	July 31	3,070	23 8/60	60
Northern White Fife	Aug. 5	3,460	29	57
Saskatchawan	5	5,705	28 15/60	57 1/2
Canada Imperial	13	3,340	29 48/60	60
French	13	3,550	25 18/60	58
Scotch Fyfe	.....	4,995	21 33/60	56

The season was favorable for this crop and the yields were fair but the quality of the grain so poor that we have but little hope of reaching any results in the near future favorable to this crop in this locality. With the great wheat districts lying to the northwest of us producing crops of the finest quality upon land costing only a few shillings per acre, we are practically forced out of the market. A few farmers in our state may be making money on spring wheat but the same land, capital and energy put to other uses would give better returns I am certain.

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YIELD OF OATS FOR 1884.

Our oat plats were not satisfactory this season. The crop was sown too late and though the ground had received no manure for three years previous, the straw grew so rank that every plat was badly ledged, and a light grain and yield were the result. The table here given shows the results of the trials with plats of one-twentieth of an acre each. No. 8, was from C. E. Angell, Oshkosh, but being sown later than the rest should not be compared with them.

COMPARATIVE YIELD OF SEVERAL VARIETIES OF OATS; EACH PLAT ONE-TWENTIETH OF AN ACRE.

NAME OF VARIETY.	Date of sowing.	Date of harvesting.	Rate of seed per acre.	Weight of straw on plat.	Yield of grain on plat.	Weight of grain per struck bushel.	Yield per acre at same rate.
				lbs.	lbs.		
Welcome	April 29	July 31	2 bu.	326	99	37	61 11/31
Black Tartarian	April 29	Aug. 5	2 bu.	306	103¼	36	64 11/31
American Triumph.	April 29	Aug. 13	2 bu.	320	77½	32	48 8/31
Hallers or Bohemian	April 29	July 31	2 bu.	296	.....	.....	.....
White Schonen.....	April 29	Aug. 5	2 bu.	310	104	33	65
White Australian...	April 29	Aug. 5	2 bu.	322	110	33	68 11/31
White Belgium.....	April 29	July 31	2 bu.	340	101½	34	63 8/31
No. 8.....	May 9	Aug. 5	2 bu.	316	71	29	44 11/31

SALT AS A FERTILIZER.

While the use of salt for spring grains has proved beneficial in many localities in the state, repeated trials show no improvement by its use in our case.

Observation shows salt to be of the most value on lands badly run with spring grain. Where the straw is rank and

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"crinkles down" badly it is valuable, yet it would seem that a proper rotation of crops is the best remedy after all, as salt really adds nothing to the fertility of the soil. The trial here reported is the last we shall make probably on this farm. A glance at the table shows no relation between the salt and the quantity of oats, and no positive evidence of increase in quality. These oats lodged badly, no evidence appearing that the salt stiffened the straw.

COMPARATIVE YIELD OF PLATS OF OATS WITH AND WITHOUT SALT: EACH PLAT ONE TWENTIETH OF AN ACRE.

NUMBER OF PLAT.	Amount of salt sown on plat.	Rate of salt per acre.	Yield of straw.	Yield of grain.	Weight per bushel.	Rate of yield per acre in bu. of 32 lbs. each.
	lbs.	lbs.	lbs.			
I	0	0	300	71½	26	44 11/32
II	3¾	75	292	87	30	54 11/32
III	0	0	260	77½	32	48 1/32
IV	7½	150	266	83	32	51 19/32
V	0	0	240	74½	31	46 1/32
VI	15	300	310	84¾	32	52 11/32
VII	0	0	270	80½	32	53 4/32
VIII	22½	450	264	78¾	33	49 7/32

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A BULL PASTURE FENCE.

BY W. A. HENRY.

There is an old saying among breeders that "the bull is half the herd," and none is more true. It is a sad commentary on our methods of caring for animals so important, that they should be considered old at three or four years of age, as is now the case with most breeders. yet, with the methods prevailing we cannot expect anything different.

One will find bulls of the best breeding shut up in dark stalls, month after month, the veriest prisoners, only seeing the sun when brought out for service. The bull is regarded as a necessary evil upon the farm and by means of a strong box stall, a ring in the nose, and a chain, is held in subjection. That he becomes cross and dangerous under these conditions is not to be wondered at. Anyone who has noticed how changed a dog is after having been fastened to his kennel for a couple of weeks, as compared with the same animal in freedom, can easily see that were bulls allowed their freedom they might become or rather continue be be more or less tractable. It seems hard that just as the first get of a bull arrives at maturity and the breeder has the opportunity to judge of his ability as a stock getter, it is time to take him to the shambles.

At the farm we have tried, with the best of success, to give our bulls natural conditions and the methods may be of interest to others. About two acres of pasture land were surrounded with a five barb-wire fence, the cedar posts holding the wires being set eight feet apart. The entrance to this lot is closed by a heavy plank gate securely fastened. Into this lot we turn our bull in summer with the same regularity that the cows are put to pasture. For company bull calves or heifers in calf are pastured in the same lot.

We have had several different bulls in this pasture, often two at a time, and not one has dared so far to break over the enclosure, though in two instances, cows in heat stood just outside.

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I would recommend to our farmers to enclose lots in this way and lengthen the lives of their bulls, by giving them pasture and sunlight. With such a place to keep a bull in, the farmer must be poor indeed who cannot afford to secure a well bred bull, for the good he will do in improving the herd during a long life.

REPORTS ON MACHINERY, ETC., UNDER TRIAL AT THE EXPERIMENTAL FARM.

BY W. A. HENRY.

THE ECLIPSE TWENTY-FOOT GEARED WINDMILL.

Rising from the roof of the main barn 50x96 feet, 24 foot posts, is the tower of the 20-foot geared windmill, presented to the Station by the Eclipse Windmill Company of Beloit. This tower is of timbers 8x8 inches in diameter, and extends 27 feet above the roof, so that from the top of the 20-foot wheel to the floor of the basement, is 94 feet in all. A shaft 68 feet in length and 1⅝ inches in diameter, extends vertically downward from the shaft of the wheel to the ceiling of the second or main floor. This vertical shaft, by means of a bevel gear, drives a horizontal shaft 58 feet long, placed near the ceiling of the second or main floor, and extending clear across the barn and out through the sides. Pulleys at various points on the horizontal shaft are used for driving the several machines used.

This windmill has been used by us for the following purposes: Shelling corn, elevating grain, grinding grain, cutting hay and corn stalks, sawing wood, running grindstone and pumping water.

The cornsheller can be run at a high speed so as to do rapid work; it is so placed that the shelled corn is elevated as fast as shelled and drops into a large bin, directly over the hopper of the feed grinder. The feed grinder has chilled iron plates for grinding the grain. As fast as ground an elevator carries the meal from the grinder to a second large storage bin, from which the meal is drawn in the room

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below for feeding purposes. By this arrangement there is no handling of the grain after the ears of corn are fed into the cornsheller until the meal is drawn for feeding.

In attempting to run the grinder at a high speed we were much dissatisfied, as the belt would slip when the wind was gusty, and the grinder required constant attention. By using a slower motion, though only two or three bushels of meal is ground per hour, yet because the feed mill requires no attention and can be run all night if necessary, we are much better satisfied than formerly, but still we think far better results should be reached with so large a windmill.

For sawing wood we have found the mill quite satisfactory, as it drives a 24 inch circular saw with great force when the wind is strong. In one trial with this mill driving the circular saw, two men sawed a cord of four-foot body oak, dry wood, twice in two in 23½ minutes. Last winter we used it for sawing 35 cords of oak and several cords of softer wood.

The mill is sufficiently powerful to drive a large feed cutter at a high speed. We have cut clover hay into inch and half lengths at the rate of two tons per hour for a whole half day.

For pumping water of course, the mill is excellent, since we have ample capacity for storage against the time when the wind does not blow. Our water system is not yet complete, yet a short description of what we have may not be out of place. A pulley on the horizontal shaft connects with a pumping jack on the main floor. The pump rod from the jack reaches down to the pump under the basement floor. This pump is connected by an inch and a half pipe, laid below frost, to a well one hundred and twenty-five feet away. From the pump an inch and a half pipe passes vertically to a one hundred and twenty barrel tank placed on the plates of the barn close under the roof.

This tank is packed about with hay to prevent freezing. When not using water in cold weather a check valve is turned in this vertical pipe, just inside the tank, and all the water in the vertical pipe is drawn out through a pit-cock in the pump-pit, thus leaving this pipe empty.

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From the vertical pipe water is drawn through connections to several points. Of these we may name the troughs in front of the cows standing in stanchions. A V trough extends in front of the cows which is used for both meal and water. By opening a valve a stream of water passes in front of the cows, and after they are through drinking the excess passes to a waste tank under the floor. When emptied meal can be fed in it. Water is carried to all the pasture lots and paddocks during the summer by inch iron pipes. The flow of water in the tanks in the pastures is controlled by automatic cut-offs so that as long as there is water in the main tank under the roof of the barn the tanks in the pastures are full. This arrangement has proved very satisfactory.

The last use to which we have put the windmill at this date is turning the grindstone. This is no small chore when much haying is done, and the wind is pretty sure to be blowing during wet weather when we take a turn at sharpening up all the sickle blades for the mower and the extra scythe blades.

To manage a geared windmill properly, requires some little practice but as we become familiar with ours we come to like it better and better. It will not do to expect too much of it, and advantage must be taken of every good wind if a large amount of work is to be done; just as we store up water in tanks against a time when the wind may fail to blow, so we must cut hay and fodder and grind grain when opportunity offers, storing that not needed for immediate consumption. As the feed-mill grinds without attention, running night as well as day, a large amount of work can be done at a minimum expense during winter.

Accurate trials giving the amount of work done with the wind at different velocities will be undertaken and reported later.

THE FARMERS' DRAINAGE LEVEL.

This useful instrument is made by W. & L. E. Gurley, Troy, N. Y.

We have used one of these more or less for two years and find it indispensable when much draining is to be done.

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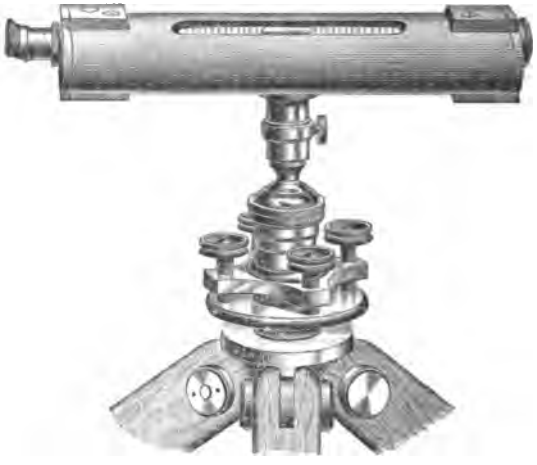
Though low in price the telescope is quite powerful and the instrument is complete in its details to do very accurate work in leveling ditches. In testing this level two persons



Farmers' Drainage Level.

determined separately the fall in a ditch one third of a mile long, and found upon comparison that their results tallied within one one thousandth part of a foot. Any young man with a little practice can handle it, and with its help plan the drainage of a field or farm.

THE LION FEED CUTTER.

This machine was received from Hauck & Comstock, Mechanicsburg, Penn.

The interesting point in this feed cutter is that cornstalks are not only cut into short pieces, but these pieces are ground and shredded so as to be more easily eaten by stock. We were led to look up this machine from the fact that during experiments in feeding cut cornstalks to cows, the cow's mouths became so sore that they got "off feed" and we lost the whole experiment.

Trials to date show the machine does excellent work and we are much pleased with it. Of its capacity for work and the value of the food prepared by it, we hope to make exhaustive trials the coming winter.

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THE BUCKTHORN BARBWIRE.

No matter how much our farmers dislike barbwire they are forced to use it from a combination of circumstances and the best thing to do under the circumstances is to stop finding fault with the inevitable and set to work to learn how to put up good fences of this material in the most economical way. Manufacturers of wire have apparently studied up the most savage, dangerous combination possible for this purpose, not seeming to realize that they could over do the matter. Stock unacquainted with wire may need some sharp pricks at first to teach them to respect so frail a thing as the wire fence appears to be, but this lesson is soon learned.

After trying many kinds of wire we have found the Buckthorn, made by T. V. Allis, Trenton, N. J., to be the nearest perfection, if not perfect, of all. It is a flattened band of steel a little thicker in the middle than at the edge with saw teeth about one fourth of an inch long, set one inch apart on one edge of the steel band. As the wire is twisted these saw teeth present themselves apparently on both edges of the wire though really on one only. The points of advantage, we have noticed, after three years trial are:

Great strength, being the strongest wire we have tried.

It is easily seen by stock as it is a broad band of steel.

Being a broad flat band with saw-like teeth on one edge, it holds the coating of zinc when galvanized without cracking and the galvanized wire seems very strong while ordinary galvanized wire is often weak and easily broken.

It is a good sheep wire since from their shape the barbs will not pull out wool from sheep crowding against it. The bards are severe enough without being so dangerous as those of the ordinary wire.

With neat posts a very attractive fence can be made of this wire.

BUHACH OR PYRETHRUM.

Seven years ago the writer began experimenting with this insecticide and each season has only added to the opinion

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early formed that this is destined to become a standard article.

Buhach is made from the powdered flower heads of *Pyrethrum cinerariæfolium* and is harmless to all higher animals but death to insect life. A little of the powder placed upon an insect renders it helpless in a very short time and death follows. We have found the powder especially valuable for destroying lice on stock, the common cabbage worm, *Pieris rapæ* and house flies. No definite experiments are here reported from the fact that good powder properly handled is certain to destroy insects. We renew the recommendations for use as an insecticide that is perfectly safe to handle. The fine yellow powder is distributed by small bellows made for the purpose.

The active principle of the powder is a volatile oil which soon escapes when the powder is exposed to the air. This should be borne in mind both in applying and preserving the powder. For lice on stock we sprinkle the powder in the hair and throw a blanket over the animal keeping it tied up in the stable. For house flies, mosquitoes, etc., the windows and doors should be closed and the powder blown through the air of the room from the bellows. The flies will soon show signs of irritation and in from ten to twenty minutes all be lying helpless. They should then be swept up and destroyed.

The powder used at the station was received from G. N. Milco, Stockton, California, who grows the plant and manufactures the product.

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THE SPOT DISEASE OF STRAWBERRY LEAVES.*

(*Ramularia tulasnei* Sacc.)

BY WILLIAM TRELEASE.

For three or four years a growing alarm has been manifested at the spread of a destructive disease of the strawberry, which has generally gone under the name of "rust" or "blight." The most typical form of this disease is shown in figure 1. A small purple spot appears on the upper face

Figure 1. Small strawberry leaf, affected with the spot disease or "white-rust." Natural size.

of the leaf, showing as a much paler blotch on the lower side. This spot usually has a pale center, which may be dull brown, gray or nearly white. In old spots the white center is very dry and papery, and is sometimes torn or broken away.

*A short account of this disease was given by the writer in the columns of the *New York Weekly Tribune* for June 13, and October 31, 1883. It has also been recently discussed by Mr. F. S. Earle, at the last meeting of the American Horticultural Society, as I learn from a report of that meeting in the *Rural New Yorker* for February 14, 1885.

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As a general thing the spots are small, the dead center varying from $\frac{1}{64}$ to $\frac{1}{4}$ inch in diameter, while the purple border is from $\frac{1}{32}$ to $\frac{1}{16}$ inch wide. Perhaps the most common size is $\frac{1}{8}$ inch, including the border, which is often nearly black where it touches the dead center, this dark shade passing into a dull red where it joins the green of the healthy leaf.

Under the microscope, the pale portion is seen to consist of dead cells thoroughly dried out, the color of which causes the buff appearance noticeable in some specimens. The white color of others is due to air, which collects in the thin-walled epidermis and between the dead pulp cells. The purple and red of the border are seen in sections of the leaf to depend upon the presence of a fluid of the same color in the diseased epidermal cells.

As the spots grow older, the dead center often enlarges, while the border increases in size correspondingly, so that its breadth remains nearly unchanged. These changes in color are caused respectively by the death of the inner part of the border, the epidermis of which then fills with air; and the encroaching of the disease on the healthy, green part of the leaf, the epidermis promptly indicating its progress by the production of a purple cell-sap.

Like other diseases of a similar nature, this spotting of strawberry leaves is found to be destructive on some varieties, while others are nearly or quite exempt. The native wild strawberries are frequently considerably discolored by it, but have not been observed to show further indications of injury. Among cultivated varieties the Wilson has been most frequently mentioned as rusting badly, partly, no doubt, because of the determined opposition of many persons to this old variety; but the odium of rusting badly is about equally shared with it by the Downing. From my observation, and from the testimony of correspondents of the station, I should give the following list as spotting most in this section: *Downing, Wilson, Russell's Prolific, Big Bob, Bidwell, Captain Jack, Forest Rose* and *Manchester.* The *Crescent* is one of the varieties least affected, though by no means entirely exempt; and, indeed, it may be said that at

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different times the same variety shows a very different susceptibility to attack. The *Windsor Chief* and *Sharpless* are also noticeably free from rust.

Professor Budd, whose opinion is always worth quoting, writes that the progeny of the Hovey seedling are most affected by rust, while the varieties that are most exempt, are those starting from the seedlings of J. S. Downer, of Kentucky, which possess the resistant foliage of the Chili strawberry.

So far as can be made out, the disease is favored by hot, wet weather in early or mid-summer. It generally appears in its worst form soon after the berries are picked, and is often especially noticeable when a wet spell is followed by drought. Whatever tends to lower the vitality of the plant is believed by several intelligent correspondents to promote the severity of the disease. The character of the soil does not appear to materially affect its severity, and the only pronounced opinions on this point are contradictory, Professor Peck* considering dry sandy soil favorable to its development, while Soraer* holds an exactly opposite opinion; nor has it been satisfactorily determined that new plants are more liable to its attacks on land where it has prevailed than on fresh ground, other things being equal, though there is reason for suspecting that something of the sort may ultimately be demonstrated.

The effects of this spotting when it occurs in a mild form, are usually confined to the destruction of the leaves that are most badly discolored, their places being taken by others after the bearing season. This, in itself, causes no very serious injury, for it has been noticed that the unfolding of a second set of leaves is natural to the strawberry plant. In seasons favorable to its development, however, the disease soon appears on the new foliage, which is often completely destroyed. The condition of the summer leaves determines, as a rule, the prospects for a satisfactory crop of fruit the next spring, as the material for its formation is largely the result of their activity; and it has been found by common experience that when they have been destroyed or seriously

* See references below.

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affected the plants are seldom worth wintering[1]. Mr. Wm. S. Trowbridge, of Milwaukee, who first showed me the disease in its worst form, in 1882, tried the experiment of keeping a bed of badly infested plants for the next season, but found that they were not only so weakened as to promise little fruit, but as soon as the first new leaves showed in the spring they were destroyed by rust, so that the plants were absolutely worthless.

Like the "rot," "blight," or "murrain" of potatoes, and the "scab" of apples, the spot-disease of the strawberry is a direct manifestation of the attacks of a parasitic fungus, which, feeding on the tissues of the leaves, causes disease and often death in them.

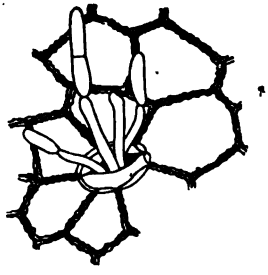

Figure 2. Bit of epidermis from a strawberry leaf, showing a small tuft of spore-bearing threads of *Ramularia tulasnei* emerging through a stoma (× 425).

In its mode of life this fungus resembles somewhat the onion mold, described in the station report for 1883[2], as it consists of a series of delicate threads, which, creeping between the cells of the leaf, nourish themselves at the expense of the latter. Like that of the onion mold, the mycelium of the strawberry parasite sends fertile branches through the

[1] In this connection, attention is called to a letter from J. M. Smith, of Green Bay, printed at the end of this article.

[2] By an oversight it was stated in the article referred to (p. 44) that resting-spores are unknown in *Peronospora schleideniana*. They were, however, described by Cornu, in his enumeration of the Peronosporeae of France (Bull. Soc. bot. de France, XXV., 298), and have been more recently figured by the same observer (Étude sur les Péronosporées, II., Paris, 1882, pl. 4, f. 9).

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stomata or pores of the leaf (fig. 2); but a glance at the figure shows that with this the similarity ends. In fact, the fruiting threads of the strawberry fungus are short, and, though somewhat knotty, usually unbranched, each ending in an oblong spore, rounded at either end. These spores or conidia measure 3-4 μ* in diameter and 20-50 μ in length. Both threads and spores are colorless. The latter are always composed of a single cell when young, but when mature they are not infrequently divided by a cross wall near the middle, and, rarely, two such partitions are observable, making the spore three-celled. The conidia being small and very light, are easily transported from place to place, and each is capable of developing into a new mycelium under favorable conditions, so that these organs are true summer spores serving to propagate the species.

Usually, so far as my observations have gone, the fungus passes the winter with us as living mycelium in slightly diseased leaves, aided, possibly, by hibernating conidia. In March, 1883, Mr. Trowbridge was kind enough to send me a package of leaves, taken from a badly spotted bed, which showed a special winter state of the species, in the form of clusters of small, black, egg shaped protuberances on both surfaces of the leaves. Two of these are shown, in a cross section of the leaf, in figure 3. They are obviously compact outgrowths from the mycelium, which may be seen between the dead and browned cells of the leaf, and correspond to the sclerotia in which many other fungi—*e. g.*, the ergot of rye and other grasses—pass the winter. In their growth the sclerotia, which originate within the leaf, burst the epidermis, and finally protrude, as is shown in the figure.

With a view to determining the further development of these bodies, several of the leaves bearing them were laid on moist sand and covered with inverted glasses, in the laboratory, so that they were kept in a moist, warm atmosphere. Within a very few days the clusters of sclerotia appeared whitish to the naked eye, and a section through

* 1 $\mu = \frac{1}{1000}$ of a millimeter, or, nearly, $\frac{1}{25000}$ of an inch.

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them (Fig. 3) showed this to be due to the development of numerous delicate, colorless threads, each of which soon terminated its growth by the production of a one-or two-celled spore, in every way comparable to those found on the leaves in summer. Up to the present time no other form of fruit has been detected on any of the spotted leaves that I have examined.

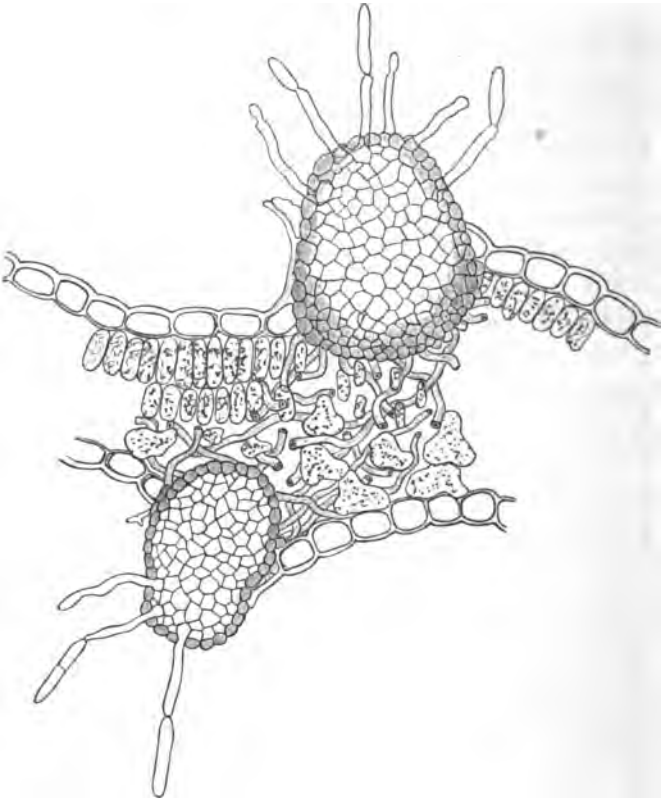

Figure 3. Section through two sclerotia of *Ramularia tulasnei*, in a diseased strawberry leaf (× 425).

Though it has but recently excited alarm as seriously threatening the strawberry interests of the country, this spot disease is by no means a new development. As a child I noticed the discolored leaves of wild plants in New York

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and New England; and even in the Mississippi Valley, where its greatest powers for injury have been recently evinced, it has been familiar to cultivators for many years. Nor is it confined to the United States, or even to the western continent, for it occurs over the whole of Europe.

The first study of this fungus appears to have been made by the Tulasne brothers, something over twenty years ago, who figured and described what may have been the same thing as the summer condition of what is now known as *Sphaerella* (or *Stigmatea*) *fragariae* (Tul.),[1] a species which develops late in the season in a form externally closely resembling the sclerotia described above.[1] What may have been the same winter condition had been previously imperfectly described by Wallroth,[2] under the name *Sphaeria fragariaecola* Wall., as developing on similarly discolored strawberry leaves. Tulasne's figures and conclusions have been substantially repeated by a number of subsequent writers on plant diseases.[3]

In 1879 Saccardo described the summer form, with which this article is concerned, under the name *Ramularia tulasnei* Sacc.,[4] apparently convinced that it was distinct from the *Sphaerella*, as, in referring to Tulasne's description, he mentions it as described there *as if* the conidial state of the latter, with which no effort is made to connect it in his great compilation.[5] Frank is also disposed to question the genetic connection of the two.[6]

The American form has been recently characterized by Peck, under the name *Ramularia fragariae* Pk.,[7] but there

[1] Tulasne: Selecta fungorum carpologia, II., 286, pl. 31.

[2] Wallroth: Flora cryptogamica Germaniae, II., 767.

[3] Sorauer: Pflanzenkrankheiten, Berlin, 1874, 336–8, pl. 11; D'Arbois de Jubainville and Vesque: Les Maladies des Plantes cultivées, Paris, 1878, 270–1, pl. 5, f. 2; Comes: I Funghi in rapporto all, Economia domestica ed alle Piante agrarie, Naples, 1880, 139–140, pl. 33, f. 80–1.

[4] Saccardo: Michelia, I., 536. For published specimens see Ellis: North American Fungi, No. 1239, and Linhart; Fungi hungarici, No. 382—the latter accompanied by a copy of the Tulasne figures.

[5] Saccardo: Sylloge fungorum, 1882, I., 505.

[6] Frank: Die Krankheiten der Pflanzen, Breslau, 1880, 607.

[7] Peck: 34 Rept. New York State Museum of Natural History, Albany, 1881 (issued in December, 1883), 30–1, pl. 3, f. 12–15.

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does not seem to be any good reason for separating it from the European species.

The sclerotia that have been described as occurring on the Milwaukee specimens agree so closely in their external characters with the perithecia in which winter spores are formed by *Sphaerella fragariae* that it may well be doubted whether they do not represent an immature condition of the latter, which is, moreover, known to occur in the United States. This suspicion is further warranted by the fact that in the plate already referred to, Tulasne figures a cluster of conidial threads originating from the top of a perithecium, much as they have been found to do from these sclerotia. While at best, therefore, the proof is incomplete, the connection insisted on by the able French mycologists is not improbable, though the conidial form as figured by them is not identical with that with which we are concerned.

So far as an examination of numerous specimens shows, *Ramularia tulasnei* is the sole cause of the troublesome spotting of strawberry leaves in this state;[1] but it should be noted that *Ascochyta fragariae* Sacc.,[2] *Phyllosticta fragaricola* Desm.[3] and *Septoria fragariae* Desm. sometimes cause discolorations of the same general character, and are unquestionably capable of inufluencing the health of the plant in a similar manner. The last named species is held to be but the spermagonial state of *Spharella fragariae*.[4] According to Mr. Frazer S. Crawford, to whom I am indebted for specimens, the *Phyllosticta* is common, almost universal, in south Australia, but does not appear to do very much harm there.

The preceding account of the American disease points to several methods of treatment which may be available to a certain degree for the prevention of much loss by its ravages. It is advisable to select for planting, those varieties which

[1] *Cf.* Rept. Connecticut Agl. Exp. Sta., 1878, 108–111.

[2] Saccardo: Michelia, I., 169; Sylloge fungorum, III., 399.

[3] Desmazières; Plantes Crypt., No. 633; Saccardo: Michelia, I., 140, and Sylloge fungorum, III., 40.

[4] *Septoria aciculosa* Ell. and Everh. is also said by its authors to accompany *Sphaerella fragariae* — Bull. Torrey Bot. Club, July 1884, XI., 73.

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have proved best able to resist its attacks, and especially to reject those which are notorious for spotting badly, more particularly in sections where trouble has already been experienced and is most feared. Some advantage may be hoped for from the free use of lime, wood-ashes, flowers of sulphur, etc., when it first appears in a bed, as a great number of conidia may thus be destroyed, and its progress possibly checked; but the protected position of the mycelium within the leaf precludes the possibility of doing more than this by external applications.

The main reliance, however, is apparently to be put on replacing weak and diseased plants by vigorous, young stock, and carefully destroying old and spotted leaves. The most convenient way of effecting this is by mowing badly rusted beds soon after the fruit is gathered, covering the dry tops with a light coating of straw or harrowing up the old mulching, and burning them. This may seem harsh treatment for the plants, but it has been resorted to by many berry-growers for the destruction of insects, often with most satisfactory results; and everyone who has tried burning over a strawberry bed has been surprised by the vigorous and healthy appearance of the new foliage which soon unfolds.

Where the disease appears with virulence after a heavy crop has been picked from the plants, no effort to save them is likely to be successful, and it will be wise economy in such cases to plow the roots under, after burning the tops, and reset the ground with fresh plants.

The following letter from J. M. Smith, of Green Bay, whose experience with strawberries is equalled by that of no other man in the state, was received after the completion of my article, but is so full of practical observations that it is appended in full:

"During the summer of 1860 or 1861, I obtained a few plants of Wilson's Albany seedling; from them I obtained a sufficient number of plants to set perhaps one eighth of an acre. The time came around for my first crop of Wilson. It was such a sight as I had then never seen or even heard of. The plants were in apparent perfect condition, and I could then see no reason why they should not give me

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an equally good crop the following year. The crop had been an enormous one, and I was very sanguine that by good care and plenty of good manure it could be repeated. During the fall they began to rust. The following season the crop, if compared with that of the previous year, was a very poor one. Not knowing what or where the difficulty was, the bed was kept another year, and the crop was almost an entire failure. In the mean time I had been setting new beds. They did well. But every time that I have been fortunate enough to get a very large crop at the first bearing of the bed, rust made its appearance during the latter part of the summer, or early in the fall, and damaged the plants more or less. If the crop has been a very large one, say at the rate of 250 or 300 bushels per acre, the plants will certainly be attacked with rust, and four out of five of them will be dead, or nearly so, the following spring. If, upon the other hand, the first crop has been a light one of, say not over 100 bushels per acre, it will pay to let it stand for a second crop. The second one will sometimes be better than the first, though this is not often the case.

During the winter or early spring of 1884, some of my neighbors' cattle got upon the ends of two of my beds and either ate or destroyed the covering and tramped the plants badly. They were not killed; still they bore but little fruit last summer. The balance of the beds bore very heavily. At the close of the picking season the portions of the bed that had been injured appeared to be very thrifty, and gave every promise of a large crop in 1885. I concluded to keep over both beds and do my best to save them for a good second crop, although they looked badly when we were done picking. We did all within our power for them, but when winter set in, I think four fifths of the plants were dead from rust, and that *just as far as they had borne heavily, but no farther*. The portions that had been damaged and gave me but little fruit, were all that I could ask, and will doubtless bear a large crop this season. I have always set my strawberry plants upon rich land, have always manured heavily, and cultivated as thoroughly as I knew how.

In short the history of the Wilson has been that if the first

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crop was a very large one, the vines will be attacked with rust during the latter part of summer or early fall, and will be either dead or so near it as to be not worth keeping for a second crop.

Upon the other hand if they have borne lightly, it is safe to keep them over for a second crop. They will be damaged but little, if any, by the rust.

This has been my experience with the Wilson for nearly twenty-five years, and there has not been a single exception to the rule. Does it not go a good ways toward showing that rust attacks plants that are already weakened, either by overbearing or some other cause?

Last season I had two small beds of Manchester. One of them had been allowed to run, and the vines nearly covered the ground. The other bed had been kept in stools,—all runners carefully cut off.

The stools were very large and fine in all respects. They bore an immense crop of beautiful berries, outbearing the Wilson that grew by their side. They were attacked with the rust about the same time the Wilson was, and by the first of November nearly every stool was dead. The other bed that had been allowed to run, had borne very well, but not as well as the stool bed, and they were but little injured. Is not this another point in the same direction? I have spoken of the Wilson in particular because I have had more experience with that than any other variety. We have now become so well acquainted with it that we can tell by the appearance of a bed when we are done picking whether it will pay for keeping another year or not.

I have had some other varieties that seemed inclined to rust, and, in fact, do everything except give me a good crop of fruit. Such has been the case with Seth Boyden's No. 30, the Jucunda, Captain Jack and others. Sharpless has been afflicted but very little with either rust or fruit.

The Crescent has resisted rust the best I think of any good bearing variety that I have ever tried: but it is not free from it, and with me it appears upon the vines under the same conditions as upon the Wilson.

Two years since we had three tremendous thunder storms

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during the picking season, not less than 12 to 15 inches of water falling, and winding up with a very heavy hail storm. Plants were loaded with fruit, and we were compelled to let them stand with their roots in earth that was like a bed of mortar, (the drains would not carry off the water fast enough); then they were beaten into the ground by the hail.

The result of this was that rust appeared almost immediately, and the plants never entirely recovered from the effects of it.

From my observations I am inclined to the belief that strong, healthy plants about here are not afflicted by rust, until they have been weakened in some manner.

I shall watch my plants more closely this season with this object in view, and if I become satisfied that I am mistaken in my view I will not hesitate to acknowledge it.

APRIL 2, 1885.

In closing this article, I wish to acknowledge my indebtedness for information given in response to letters of inquiry to Hon. B. F. Adams, of Madison, Prof. J. L. Budd, of Ames, Iowa, Prof. T. J. Burrill, of Champaign, Illinois, Secretary Chas. W. Garfield, of Grand Rapids, Michigan, Mr. A. L. Hatch, of Ithaca, Hon J. M. Smith, of Green Bay and Mr. Wm. A. Springer, of Fremont.

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WHEN THE LEAVES APPEAR AND FALL.

In continuation of the tables in the FIRST ANNUAL REPORT OF THE EXPERIMENT STATION, pp. 56–73, the following observations for 1884 and the spring of 1885 are published. They are based on notes taken under my direction, by W. M. Perkins and H. F. Lueders. For certain reasons the omission of all but a few common and representative species has been thought best.

With respect to the fall of the leaves, it has been noticed that three more or less distinct periods are observable. The first, occurring, on an average, a week earlier than the main fall, is marked by the loss of the leaves of weakly twigs. The second comprises the main defoliation. The third embraces the period during which straggling leaves, mostly on branches which have been shaded during the growing season, successively disappear; this period is often limited only by the beginning of growth the next spring.

It is well known that most leaves fall in consequence of the formation of a distinct joint, usually at the base of the leaf stalk. It is interesting to note that in very many of our trees the weakened twigs also are annually cast off by a similar process. This is especially observable in several willows, which are often spoken of as having "brittle" branches, although their wood is tough except where the joints referred to occur. The cottonwood and white elm show the same peculiarity well, the joints being formed at the commencement of the year's growth, so that the growth of from one to seven or eight years is often pruned off by a gale in autumn; and, as has been said, it is observable on oaks and many other trees.

There seem to be two reasons for this provision. The fallen twigs of species which grow in wet places have been observed to strike root, thus serving as natural cuttings for the propagation of the species; on the other hand it is clearly an advantage to the tree to lose weak branches that would make at best but a poor growth, while shading and otherwise interfering with the development of the stronger shoots.

WM. TRELEASE.

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TABLE I. TIME OF LEAFING, 1884.

NAME OF PLANT.	APRIL.	MAY.	MAY.	JUNE.
Silver Maple. (*Acer dasycarpum.*)	28—Flower stalks ½ in. long. 30—Leaves appear.	5—Leaves 1⅛ in. long.* 10—Leaves 1¾ in. long. 15—Leaves 3½ in. long. Twigs ½ in. long.	20—Leaves 4 in. long; fruit falling; twigs ¾ in. l'g 26—Leaves 4⅜ in. long. Twigs 1½ in. long.	2—Leaves 4½ in. long; seed fallen; twigs 5 in. long. 8—In full leaf.
Sugar Maple. (*Acer saccharinum.*)	17—Flower buds open.	12—Leaves appear. 15—Leaves 2½ in. long. 20—Leaves 4⅛ in. long. Twigs 6½ in. long.	21—Blossoms fall. 26—Leaves 5½ in. long. Twigs 6½ in. long.	2—Leaves 8⅛ in. long. Twigs 7 in. long. 9—Fruit begins to fall. 10—In full leaf.
Horse Chestnut. (*Aesculus hippocastanum.*)		7—Buds swell. 12—Leaves appear. 15—Leaves 1 in. long.	20—Leaves 4 in. long. 26—Leaves 7½ in. long. Twigs 8½ in. long.	2—Leaves 8½ in. long. Twigs 12 in. long.
Cut leaved White Birch. (*Betula alba.*)	28—Catkins 2½ in. long.	2—Catkins 4 in. long. Leaves ⅞ in. long. 10—Leaves 1½ in. long. 15—Leaves 3½ in. long.	20—Leaves 3½ in. long. 26—Leaves 8¼ in. long.	2—In full leaf.
Hazel. (*Corylus americana.*)	17—Catkins 2 in. long shedding pollen. Pistillate flowers opening. 23—Leaves appear.	2—Leaves ⅝ in. long. 7—Leaves 1½ in. long. 10—Leaves 1½ in. long. 15—Leaves 2½ in. long.	20—Leaves 3½ in. long. Twigs 4 in. long. 26—Leaves 5½ in. long. Twigs 8 in. long.	2—Leaves 5½ in. long. 2—Twigs 10 in. long. 12—Leaves 6 in. long. Twigs 14 in. long.

*Length of leaf includes only the blade, on the more advanced lower limbs.

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European Larch. (*Larix europaea.*)	28—Buds opening.	2—Leaves $\frac{5}{8}$ in. long. 5—Leaves 1 in. long. 10—Leaves $1\frac{1}{2}$ in. long. 15—Leaves $1\frac{1}{2}$ in. long.	20—Leaves $1\frac{5}{8}$ in. long. 26—Twigs $2\frac{1}{2}$ in. long.	2—Twigs $3\frac{1}{2}$ in. long. 12—Twigs 6 in. long.
Box Elder (*Negundo aceroides*).	28 — Stamens appearing.	2 — Leaves 1 inch long. 5 — Pollen fallen. 10 — Leaves $1\frac{1}{8}$ in. long. Stamens fallen.	15 — Leaves $2\frac{5}{8}$ in. long. 20 — Leaves $3\frac{5}{8}$ in. long. Twigs 6 in. long. Fruit visible. 26 — Twigs $7\frac{1}{2}$ in. long.	2 — Leaves $5\frac{1}{2}$ in. long. Twigs 9 in. long. 12 — In full leaf. Twigs 11 in. long.
Cottonwood (*Populus monilifera*).	17 — Catkins appearing. 28 — Pollen falling.	2 — Catkins fallen. 5 — Leaf-buds bursting. 10 — Leaves $1\frac{7}{8}$ in. long. 15 — Leaves $3\frac{1}{8}$ in. long.	20 — Leaves $3\frac{1}{2}$ in. long. Twigs 3 in. long. 26 — Leaves $4\frac{1}{2}$ in. long. Twigs $3\frac{1}{2}$ in. long. In full leaf.	
Choke-Cherry (*Prunus virginiana*).	28 — Buds bursting.	2 — Leaves $\frac{3}{4}$ in. long. 10 — Leaves $1\frac{1}{8}$ in. long. Twigs $3\frac{1}{2}$ in. long. 15 — Leaves 2 in. long. Twigs $5\frac{1}{2}$ in. long.	20 — In full blossom. 26 — Leaves $3\frac{1}{2}$ in. long. Twigs $3\frac{1}{2}$ in. long.	2—Leaves $4\frac{1}{2}$ in. long. Twigs $9\frac{1}{2}$ in. long. 12—In full leaf. Twigs $11\frac{1}{2}$ in. long.
European Mountain-Ash (*Pyrus aucuparia.*)	28 — Buds open.	2 — Leaves $1\frac{1}{2}$ in. long. 5 — Leaves $1\frac{1}{2}$ in. long. 10 — Leaves $1\frac{5}{8}$ in. long. 15 — Leaves $2\frac{1}{2}$ in. long.	26 — Leaves $3\frac{5}{8}$ in. long.	2—In full leaf.
Duchess Apple (*Pyrus malus.*)		10 — Flower buds appear. 15 — In full blossom. Leaves $1\frac{1}{4}$ in. long.	20 — Leaves $2\frac{1}{2}$ in. long. 26 — Leaves $3\frac{1}{2}$ in. long. Petals fallen.	2—In full leaf. Apples set.

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Horse Chestnut. (*Aesculus hippocastanum.*)		7—Buds swell. 12—Leaves appear, 15—Leaves 1 in. long.	20—Leaves 4 in. long. 26—Leaves 7½ in. long. Twigs 8½ in. long.	2—Leaves 8½ in. long. Twigs 12 in. long.
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* Length of leaf includes only the blade, on the more advanced lower limbs.

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European Larch. (*Larix europaea.*)	28—Buds opening.	2—Leaves ⅛ in. long. 5—Leaves 1 in. long. 10—Leaves 1½ in. long. 15—Leaves 1½ in. long.	20—Leaves 1⅝ in. long. 26—Twigs 2½ in. long.	2—Twigs 3¼ in. long. 12—Twigs 6 in. long.
Box Elder (*Negundo aceroides*).	28 — Stamens appearing.	2 — Leaves 1 inch long. 5 — Pollen fallen. 10 — Leaves 1½ in. long. Stamens fallen.	15 — Leaves 2⅝ in. long. 20 — Leaves 3⅛ in. long. Twigs 6 in. long. Fruit visible. 26 — Twigs 7½ in. long.	2 — Leaves 5⅞ in. long. Twigs 9 in. long. 12 — In full leaf. Twigs 11 in. long.
Cottonwood (*Populus monilifera*).	17 — Catkins appearing. 28 — Pollen falling.	2 — Catkins fallen. 5 — Leaf-buds bursting. 10 — Leaves 1⅞ in. long. 15 — Leaves 3⅛ in. long.	20 — Leaves 3¼ in. long. Twigs 3 in. long. 26 — Leaves 4½ in. long. Twigs 3½ in. long. In full leaf.	
Choke-Cherry (*Prunus virginiana*).	28 — Buds bursting.	2 — Leaves ¾ in. long. 10 — Leaves 1½ in. long. Twigs 3½ in. long. 15 — Leaves 2 in. long. Twigs 5½ in. long.	20 — In full blossom. 26 — Leaves 3¾ in. long. Twigs 8½ in. long.	2—Leaves 4½ in. long. Twigs 9½ in. long. 12—In full leaf. Twigs 11½ in. long.
European Mountain-Ash (*Pyrus aucuparia.*)	28 — Buds open.	2 — Leaves 1½ in. long. 5 — Leaves 1½ in. long. 10 — Leaves 1¾ in. long. 15 — Leaves 2½ in. long.	26 — Leaves 3⅜ in. long.	2—In full leaf.
Duchess Apple (*Pyrus malus.*)		10 — Flower buds appear. 15 — In full blossom. Leaves 1¾ in. long.	20 — Leaves 2½ in. long. 26 — Leaves 3½ in. long. Petals fallen.	2—In full leaf. Apples set.

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TABLE I.—TIME OF LEAFING.—Continued.

NAME OF PLANT.	APRIL.	MAY.	MAY.	JUNE.
White Oak (*Quercus alba.*)		7—Buds swelling. 12—Leaves appear. 15—Leaves 1½ in. long. Twigs 1½ in. long.	20—Leaves 2⅝ in. long. Twigs 8½ in. long. 26—Leaves 5 in. long. Twigs 9 in. long.	2—Leaves 6⅝ in. long. Twigs 9 in. long. 12—In full leaf. Twigs 10½ in. long.
Red Oak (*Quercus rubra.*)		7—Buds swelling. 10—Leaves appear. 15—Leaves 1¾ in. long. Twigs 2½ in. long.	20—Leaves 3¾ in. long. Twigs 4 in long. 26—Leaves 6 in. long. Twigs 5 in. long.	2—Leaves 8½ in. long. Twigs 9 in. long. 5—In full leaf.
Missouri Currant. (*Ribes aureum.*)	28—leaves ⅜ in. long.	2—Leaves $\frac{5}{16}$ in. long. 5—Leaves ⅜ in. long. 10—Flower buds appear. 15—Flowers opening in full blossom.	20—Leaves 1½ in. long. Twigs 8½ in. long. 26—Leaves 1½ in. long. 29—In full leaf.	
American Elm. (*Ulmus americana.*)	17—Buds bursting. 28—Buds open.	5—Leaves ½ in. long. 10—Leaves 1½ in. long. 15—Leaves 2⅝ in. long.	20—Leaves 3½ in. long. 26—Leaves 5 in. long. Fruit falling.	2—Leaves 5½ in. long. Twigs ¼ in. long. 12—In full leaf.

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TABLE II.—FALLING OF LEAVES, 1884.

NAME OF PLANT.	LEAVES BEGIN TO FALL.	LEAVES FALLEN.	NAME OF PLANT.	LEAVES BEGIN TO FALL.	LEAVES FALLEN.
Silver Maple. (*Acer dasycarpum.*)	October 2.	November 1.	Choke-Cherry. (*Prunus virginiana.*)	September 24.	October 29.
Sugar Maple. (*Acer saccharinum.*)	September 20.	November 4.	European Mountain-Ash. (*Pyrus aucuparia.*)	September 26.	November 5.
Horse Chestnut. (*Aesculus hippocastanum.*)	September 21.	October 24.	Duchess Apple. (*Pyrus malus.*)	September 29.	October 20.
Cut-leaved White Birch. (*Betula alba.*)	October 20.	November 10.	White Oak. (*Quercus alba.*)	September 27.	November 25.
Hazel. (*Corylus americana.*)	September 24.	October 20.	Red Oak. (*Quercus rubra.*)	October 4.	November 20.
European Larch. (*Larix europœa.*)	October 24.	November 19.	Missouri Currant. (*Ribes aureum.*)	September 18.	October 23.
Box Elder. (*Negundo aceroides.*)	September 20.	October 26	American Elm. (*Ulmus americana.*)	September 20.	November 1.
Cottonwood. (*Papulus monilifera.*)	September 24.	October 29.	Frost Grape. (*Vitis cordifolia.*)	September 23.	October 29.

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TABLE III.—TIME OF LEAFING, 1885.

NAME OF PLANT.	APRIL.	MAY.	MAY.	JUNE.
Silver Maple. (*Acer dasycarpum.*)	16—Buds swelling. 19—Flower buds bursting 22—Flowering. 28—Leaf-buds open.	8—Leaves unfolding. 13—Leaves ½ in. long. 16—Twigs 1 in. long. 21—Leaves 1 in. long.	26—Leaves 1½ in. long. 28—Twigs 3 in. long. 31—Fruit ripe.	3—Branches 6 in. long. 10—Leaves 2½ in. long. Growth complete
Sugar Maple. (*Acer saccharinum.*)	26—Buds swelling. 28—Buds bursting.	3—Leaves unfolding. 10—Leaves ½ in. long. 16—Twigs ½ in. long. 19—Flowering.	21—Leaves ¾ in. long. 23—Twigs 2 in. long. 27—Leaves 2 in. long.	3—Twigs 4 in. long. 12—Leaves 2½ in. long. Fruit ripe.
Horse Chestnut. (*Aesculus hippocastanum.*)		3—Buds swelling. 10—Buds bursting. 13—Leaves unfolding. 16—Twigs 2 in. long.	19—Leaves 2 in. long. 23—Twigs 4 in. long. 27—Leaves 5 in. long. 31—Leaves 7 in. long.	3—Flowering. 10—Leaves 9 in. long. 10—Branches 11 in. long. Growth complete.
Cut-leaved White Birch. (*Betula alba.*)	26—Buds swelling. 30—Buds bursting.	5—Twigs ½ in. long. 10—Leaves ½ in long. 13—Leaves ¾ in. long. 18—Flowering.	21—Leaves 1 in. long. 23—Leaves 1½ in. long. 27—Leaves 1½ in. long.	3—Leaves 1¾ in. long. 5—Twigs 3 in. long. 11—Leaves 2½ in. long. Twigs 6 in. long.
Hazel. (*Corylus americana.*)	18—Catkins begin to grow 23—Flowering. 26—Leaf buds swelling. 30—Leaf buds bursting.	10—Leaves unfolding. 13—Leaves ¾ in. long. 21—Leaves 1½ in. long. 27—Twigs 1 in. long.	31—Leaves 1¾ in. long.	3—Leaves 2 in. long. 8—Twigs 4 in. long. 11—Leaves 3 in. long.

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TABLE III.—TIME OF LEAFING, 1885.—Continued.

NAME OF PLANT.	APRIL.	MAY.	MAY.	JUNE.
European Larch. (*Larix europæa.*)	26—Leaves ¼ in. long. 28—Leaves ⅜ in long.	2—Flowering. 5—Leaves ½ in. long. 10—Leaves 1 in. lo g. 16—Leaves 1½ in. long.	23—Leaves 1¾ in. long. 31—Twigs 1 in. long.	4—Leaves 2 in. long. 10—Twigs 3 in. long.
Box Elder. (*Negundo aceroides.*)	20—Buds swelling. 24—Buds bursting. 31—Leaves unfolding.	10—Flowering. 13—Leaves 1 in. long. 16—Flowering ended. 21—Twigs 3 in. long.	23—Leaves 2½ in. long. 27—Branches 6 in. long. 31—Leaves 5 in. long.	3—Leaves 5½ in. long. 7—Branches 10 in. long. 12—Leaves 6 in. long. Growth complete.
Cottonwood. (*Populus monilifera.*)	21—Buds swelling. 23—Buds bursting. 28—Catkins 1½ in. long.	3—Flowering. 5—Flowering ended. 10—Leaf buds swelling. 13—Leaf buds bursting.	16—Leaves ½ in. long. 19—Leaves 1 in. long. 23—Leaves 1½ in. long 28—Twigs 4 in. long.	3—Leaves 2 in. long. 5—Branches 8 in. long. 9—Leaves 2½ in. long. Branches 9 in. long.
Choke Cherry. (*Prunus virginiana.*)	26—Buds swelling. 28—Buds bursting.	3—Leaves unfolding. 10—Leaves ½ in. long. 13—Leaves 1 in. long. 16—Twigs 2 in. long.	19—Leaves 1½ in. long. 23—Leaves 2 in. long. 27—Flowering.	3—Flowering ended. 5—Leaves 2½ in. long. 11—Leaves 3 in. long.
European Mountain Ash. (*Pyrus aucuparia.*)	26—Buds swelling. 28—Buds bursting.	10—Leaves unfolding. 13—Leaves 1½ in. long. 16—Leaves 3 in. long. 21—Twigs 2 in. long.	23—Leaves 4½ in. long. 26—Leaves 6 in. long. 31—Flowering.	3—Twigs 6 in. long. 7—Leaves 8 in. long. 14—Branches 11 in. long. Leaves 10 in. long. Growth complete.

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TABLE III.—TIME OF LEAFING, 1885—Continued.

NAME OF PLANT.	APRIL.	MAY.	MAY.	JUNE.
Duchess Apple. (*Pyrus malus.*)		5—Buds swelling. 9—Buds bursting. 11—Leaves ¼ in. long. 16—Leaves 1 in. long.	21—Leaves 1½ in. long. 26—Flowering. 28—Leaves 2 in. long.	7—Leaves 2½ in. long. 14—Leaves 3 in. long. Branches 4 in. long.
White Oak. (*Quercus alba.*)		8—Buds swelling. 13—Buds bursting. 16—Leaves unfolding. 19—Leaves 1 in. long.	21—Flowering. 27—Twigs 3 in. long. 31—Leaves 2 in. long.	3—Leaves 3 in. long. 12—Leaves 6 in. long. Branches 12 in. long. Growth complete.
Red Oak. (*Quercus rubra.*)		8—Buds swelling. 13—Buds bursting. 16—Leaves unfolding. 21—Leaves 1½ in. long.	23—Flowering. 27—Twigs 6 in. long. 31—Leaves 3¾ in. long.	9—Leaves 5½ in. long. 9—Branches 11 in. long growth complete.
Missouri Currant. (*Ribes aureum.*)		3—Buds swelling. 8—Buds bursting. 10—Leaves unfolding. 16—Leaves 1½ in. long.	21—Flowering. 27—Leaves 1 in. long. 31—Twigs 8 in. long.	3—Leaves 1½ in. long. 13—Leaves 2 in. long.
American Elm. (*Ulmus americana.*)	17—Buds swelling. 20—Buds bursting. 26—Flowering.	3—Leaf buds bursting. 10—Leavee unfolding. 16—Leaves ½ in. long. 23—Twigs 1½ in. long.	27—Leaves 1½ in. long. 31—Leaves 1½ in. long.	3—Fruit ripe. 9—Leaves 2½ in. long.

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COMPOSITION AND DIGESTIBILITY OF FEEDING-STUFFS.

BY H. P. ARMSBY.

The following experiments were undertaken with two objects in view: first, to learn the chemical composition and the amounts of digestible matters contained in certain feeding stuffs which it was proposed to use in subsequent experiments; and second, to contribute something, incidentally, to our knowledge of the digestibility of the stock foods in common use in Wisconsin.

The methods of cattle feeding worked out by the scientific experiments of the last twenty years require as their basis a knowledge of the average composition and digestibility of the feeding-stuffs in common use. Thanks to the labors of American experiment stations, we have now a very fair knowledge of the composition of American feeding-stuffs, but for estimates of their digestibility we have been obliged to take the results of experiments on those grown in foreign countries, the digestibility of only one of our fodders having thus far been made the subject of experiment.

As it was desired to ascertain by these trials the average quality of a considerable amount of each feeding-stuff, particular attention was paid to obtaining fair samples. This is comparatively easy in the case of concentrated feeds, like grain or meal, but to obtain a fair average sample of two or three tons of hay is a more difficult matter. The following method was adopted, and, though laborious, it answered its purpose excellently.

The material (clover hay), to the amount of about three and one half tons, was run through a Belle City feed cutter, using nominally a half inch cut, although most of the hay was not actually cut as fine as that. The cut hay was spread out on a tight floor and thoroughly mixed, being handled entirely with shovels. From the mixed mass two portions, of about 500 pounds each, were taken and stored

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separately in bins, to be used in the digestion experiments, while the remainder of the hay was reserved for subsequent feeding trials. From each of the two portions just spoken of, two analysis samples were taken during the digestion experiments, so that we possess analyses of four samples of this hay. In the subjoined table these are numbered 1, 2, 3 and 4, and their close agreement attests the accuracy of the sampling.

COMPOSITION OF FEEDING-STUFFS.

Station No.		Water	Ash.	Protein.	Crude Fiber	N. free Extract.	Fat.
	SAMPLES AS TAKEN.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
1	Clover Hay	16.13	4.29	11.31	27.12	39.58	1.57
2	Clover Hay	16.41	4.17	10.88	27.58	39.49	1.47
3	Clover Hay	15.41	3.88	11.61	27.27	40.04	1.79
4	Clover Hay	16.34	4.06	11.39	27.51	39.22	1.48
5	Malt Sprouts	11.97	3.75	21.00	11.99	50.00	1.29
10	Cotton-seed Meal	7.59	6.48	44.00	2.77	25.72	13.44
	CALCULATED WATER-FREE.						
1	Clover Hay	.....	5.11	13.49	32.34	47.19	1.87
2	Clover Hay	.....	4.99	13.02	32.99	47.24	1.76
3	Clover Hay	.....	4.59	13.73	32.24	47.32	2.12
4	Clover Hay	.....	4.85	13.61	32.88	46.89	1.77
5	Malt Sprouts	.....	4.28	23.86	13.65	56.79	1.46
10	Cotton-seed Meal	.....	7.01	47.61	3.00	27.83	14.55

Some explanations of the terms used may be helpful. All feeding-stuffs contain in their natural state more or less water, even when apparently dry. Its amount is determined by drying the fodder at a temperature slightly above that of boiling water until it ceases to lose weight. Ash signifies the incombustible portion of the fodder, which is left when the "organic matter" is burned off. Protein includes a number of related bodies, all containing about 16 per cent. of the element nitrogen, and more or less resembling white of egg or lean meat in their properties. They are especially important because they are the materials out of which the muscles, tendons, ligaments, and all the internal organs — in short what we may call the working

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machinery — of the animal body are formed. Crude fiber, or woody fiber, forms the skeleton, so to speak, of plants. Its digestible portion is cellulose, seen in a nearly pure state in the fibers of cotton and in paper pulp. Fat means the matter extracted from the fodders by ether. In the grains and their bye-products it is nearly all pure fat, but in hay, etc., it consists of a mixture of fat with various other substances. Nitrogen-free extract signifies what remains of the fodder after the other ingredients have been determined. In most of the concentrated fodders it consists chiefly of starch or related substances, but in the coarse fodders it is a mixture of substances whose separate determination is not yet possible. That portion of it which is digestible, however, has the composition of starch.

DIGESTIBILITY OF FODDERS.

Of the fodder which an animal eats, a portion is converted into soluble compounds in the mouth, stomach and intestines, and taken into the body; it is digested. The remainder of the food, that portion which the digestive juices cannot dissolve, is finally excreted from the body, mixed with small remnants of the digestive fluids and intestinal mucus, and constitutes the dung.

If, now, we determine just how much food an animal eats and just how much of it is execreted in the dung, by subtracting the latter amount from the former we shall ascertain how much of the food has been digested. Furthermore, if we determine the amount of any particular ingredient, as protein, in fodder and excrement, the difference will show how much of that one ingredient has been digested.

Such determinations have been made on the clover hay, malt sprouts, and cotton-seed meal whose analyses are given above. The method is that which has been worked out by years of experience in the German experiment stations. Attention to many details is required, some of which are mentioned below, but where all needful precautions are observed the results are accurate.

Two grade Cotswold wethers, about three years old and weighing about 87 pounds each, were used for the experi-

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ments. The animals stood in stanchions, each in a separate stall specially built for the purpose. They were fed from zinc-lined feed boxes, which could be removed to be filled, and which were surmounted by a funnel-shaped structure of boards, which effectually prevented any scattering of the fodder. Each day's fodder was weighed out separately for from six to ten days in advance, the hay in cloth bags, the bye-fodder in glass fruit jars, and samples were taken at the same time for the determination of moisture or for complete analysis. The dung was collected in rubber-lined cloth bags, attached to the hind quarters of the animals by means of a light harness. The bags were emptied every 24 hours, the dung weighed, and a sample preserved for analysis.

Since the process of digestion in ruminants is a slow one, occupying two or three days, it is necessary in digestion experiments to observe a preliminary feeding, during which the animal receives the fodder to be tested in exactly the same quantity as during the actual experiment. In this way, remnants of the previous fodder are removed from the digestive organs, and the dung made to correspond to the fodder to be tested. Moreover, since the excretion of dung is somewhat irregular, it is necessary to extend the trial over several days and take the average excretion for one day as the basis of calculation. In these experiments the preliminary feeding and the actual trial each lasted six days, in most cases. In what follows, the weights of fodder, dung, etc., are given, as they were originally taken, according to the metric system. This system is most convenient for scientific use, and since the results of these experiments are comparative only, the object being to find out what per cent. of the fodder was digested, their use can occasion no practical difficulty. In reporting experiments whose results are directly applicable in farm practice, the Station will use the ordinary weights and measures, but for the simple calculation of percentages it makes no difference what unit of weight is adopted. We have therefore not undertaken in this case a laborious recalculation of the weights which would not alter the final result in the least; 51.7 per cent. of the dry

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matter of the hay would still be digestible, whether the weight of the hay was expressed in pounds or grammes.

PERIOD I.

During the first period, each sheep received per day 700 grammes of hay from one of the 500 pound samples mentioned on page 67, with water *ad libitum* twice per day. This amount of hay was eaten clean. The analyses on page 68 show the composition of the hay used for the preliminary feeding (No. 1) and the actual experiment (No. 2). The water-free dung had the following composition:

	Ash.	Protein.	Crude Fiber.	Nitrogen-free extract.	Fat.
	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
Sheep 1.....	6.71	14.38	35.19	41.38	2.72
Sheep 2.....	6.57	14.00	35.31	41.51	2.23

In the following table are calculated from these data the amounts of each ingredient of the hay eaten, excreted and digested per day, in the average of six days:

Digestibility.

	Dry matter.	Organic matter.	Protein.	Crude fiber.	Nitrogen-free extract.	Fat.
Sheep 1.	Grms.	Grms.	Grms.	Grms.	Grms.	Grms.
Fed, 700 grms. hay.....	586.1	556.6	77.7	191.5	276.7	10.7
Excreted, 610.6 grms. dung.....	288.6	269.2	40.4	101.5	119.4	7.9
Digested	297.5	287.4	37.3	90.0	157.3	2.8
Per cent. digested	50.8	51.6	48.0	47.1	56.8	26.2
Sheep 2.						
Fed, 700 grms. hay.....	586.1	556.6	77.7	191.5	276.7	10.7
Excreted, 640.3 grms. dung.....	286.3	267.5	41.2	101.1	118.8	6.4
Digested	299.8	289.1	36.5	90.4	157.9	4.3
Per cent. digested	51.1	51.9	47.0	47.2	57.1	40.2

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By "per cent. digested" is meant the per cent. of the total amount of the ingredient present. Thus, Sheep 1 digested 48 per cent., or a little less than one-half, of the 77.7 grms. of protein which he ate in his hay.

PERIOD II.

In the second period, Sheep 1 received 700 grms. and Sheep 2 but 650 grms. of hay from the second of the two 500 pound samples. (Analyses No. 3 and No. 4, p. 68.) Here follow the further data of this period.

Composition of Dung, Water-free.

	Ash.	Protein.	Crude Fiber.	Nitrog'n free ext.	Fat.
	Per ct.	Per ct.	Per ct.	Per ct.	Per ct.
Sheep 1	6.71	13.99	35.70	41.24	2.36
Sheep 2	6.47	14.04	35.65	41.68	2.16

Digestibility.

	Dry matter.	Organic matter.	Protein.	Crude fiber.	Nitrogen-free extract.	Fat.
	Grms.	Grms.	Grms.	Grms	Grms.	Grms.
Sheep 1.						
Fed, 700 grms. hay	591.2	563.3	80.8	192.5	278.5	11.5
Excreted, 614.3 grms. dung	287.0	267.7	40.2	102.4	118.3	6.8
Digested	304.2	295.6	40.6	90.1	160.2	4.7
Per cent. digested	51.5	52.5	50.2	46.8	57.5	40.9
Sheep 2.						
Fed, 650 grms. hay	549.0	523.1	75.0	178.8	258.6	10.7
Excreted, 534.8 grms. dung	254.4	237.9	35.7	90.7	106.0	5.5
Digested	294.6	285.2	39.3	88.1	152.6	5.2
Per cent. digested	53.7	54.5	52.4	49.3	59.0	48.6

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In the following table are brought together for more convenient comparison the results of periods I and II.

Percentage Digestibility of Clover Hay.

	Dry matter.	Organic matter.	Protein.	Crude fiber.	Nitrogen-free extract.	Fat.
Sheep 1.	Per cent.	Per cent.	Per cent.	Per cent	Per cent.	Per cent.
Period I	50.8	51.6	48.0	47.1	56.8	26.2
Period II	51.5	52.5	50.2	46.8	57.5	40.9
Average	51.2	52.1	49.1	47.0	57.2	40.9*
Sheep 2.						
Period I	51.1	51.9	47.0	47.2	57.1	40.2
Period II	53.7	54.5	52.4	49.3	59.0	48.6
Average	52.3	53.1	49.6	48.1	58.0	44.2
Average of all	51.8	52.7	49.4	47.7	57.7	42.7*
Average of German determinations	59.0	59.0	55.0	44.0	69.0	56.0

*Excluding the result on sheep 1 in period I as probably erroneous.

The results on the two animals and for the two periods agree as closely as is to be expected in experiments of this sort. It will be noticed that the average digestibility of this sample of clover hay is somewhat less than that found by German investigators for their average clover hay, particularly as regards protein and fat, while the crude fiber is somewhat more digestible in our hay.

The differences are much less, however, than were observed between the different samples from which the German average was calculated. Two of the latter experiments, however, made with sheep upon clover hay very similar to ours in chemical composition, gave decidedly higher results for every ingredient except crude fiber.

PERIOD III.

In a third period, the digestibility of malt sprouts was the subject of experiment. It being impracticable to feed only concentrated fodder to such animals as sheep, the digestibility of a fodder like malt sprouts is determined by

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feeding it with a coarse fodder of known digestibility, in this case with the clover hay already experimented upon. Unfortunately Sheep No. 2 had to be excluded from this experiment on account of a sore foot in consequence of which he ate poorly. Sheep No. 1 received per day 600 grms. of the clover hay and 175 grms. of malt sprouts. The latter were soaked in hot water and fed while still warm. In this and the subsequent period the average of analyses 1, 2, 3 and 4 is taken to represent the composition of the hay. Its digestibility is assumed to be the average of that found in periods I and II for the animal under consideration.

Composition of Dung, Water-free.

	Ash.	Protein.	Crude fiber.	Nitrogen-free extract.	Fat.
	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
Sheep 1	6.28	14.07	34.09	43.70	1.86

Digestibility.

	Dry matter.	Organic matter.	Protein.	Crude fiber.	Nitrogen-free extract.	Fat.
	Grms	Grms.	Grms	Grms.	Grms.	Grms.
Fed, 600 grms. hay	500.9	476.4	67.4	163.3	236.3	9.4
Fed, 175 grms. malt sprouts	154.1	147.5	36.8	21.0	87.5	2.2
Total	655.0	623.9	104.2	184.3	323.8	11.6
Excreted, 681.1 grms. dung	295.2	276.6	41.5	100.6	129.0	5.5
Digested, total	359.8	347.3	62.7	83.7	194.8	6.1
Digested from hay	256.4	248.2	33.2	76.8	135.2	3.8
Digested from malt sprouts	103.4	99.1	29.5	6.9	59.6	2.3
Per cent. digested	67.1	67.2	80.2	32.9	68.1	104.6

No previous determinations of the digestibility of malt sprouts have been made, so far as I am aware.

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PERIOD IV.

In this period cotton-seed meal was tested in the same way as the malt sprouts in period III. Each sheep received per day 700 grms. of hay and 175 grms. of cotton-seed meal.

Composition of Dung, Water-free.

	Ash.	Protein.	Crude Fiber.	Nitrogen-free extract.	Fat.
	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
Sheep 1.....	6.44	15.31	34.57	41.87	1.81
Sheep 2.....	6.35	15.72	33.98	42.15	1.80

Digestibility.

	Dry matter.	Organic Matter.	Protein.	Crude fiber.	Nitrogen-free extract.	Fat.
Sheep 1.	Grms.	Grms.	Grms	Grms.	Grms.	Grms.
Fed, 700 grms. hay	588.6	559.8	79.2	191.9	277.6	11.1
Fed, 175 grms. cotton-seed meal...	161.7	150.4	77.0	4.9	45.0	23.5
Fed, total	750.3	710.2	156.2	196.8	322.6	34.6
Excreted, 814.6 grms. dung.....	316.6	296.2	48.5	109.4	132.6	5.7
Digested, total.....	433.7	414.0	107.7	87.4	190.0	28.9
Digested from hay	301.4	291.7	39.0	90.2	158.8	4.5
Digested from cotton-seed m al...	132.3	122.3	68.7	?	31.2	24.4
Per cent. digested	81.8	81.3	89.2	?	69.3	103.9
Sheep 2.						
Fed, total	750.3	710.2	156.2	196.8	322.6	34.6
Excreted, 788.8 grms. dung	311.9	292.1	49.0	106.0	131.5	5.6
Digested, total	438.4	418.1	107.2	90.8	191.1	29.0
Digested from hay	308.4	297.8	39.4	93.7	161.3	4.9
Digested from cotton-seed meal...	130.0	120.3	67.8	?	29.8	24.1
Per cent. digested.....	80.4	80.0	88.1	?	66.2	102.5

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It is of interest to compare these results with those obtained by Wolff in some recent experiments†, also on sheep:

Digestibility of Cotton-seed Meal.

	Wolff's Experiment.	Our Experiment.
Dry matter	74.0	81.1
Organic matter	80.4	80.7
Protein	84.7	88.7
Crude fiber	0	
Nitrogen free extract	83.7	67.8
Fat	87.6	103.2

In the following table the amounts of digestible matters present in these three fodders have been calculated in per cents. of the whole fodder:

	Percentage Composition.						Digestible.		
	Water.	Ash.	Protein.	Crude fiber.	Nitrogen-free extract.	Fat.	Protein.	Carbhydrates*	Fat.
Clover hay, average of four analyses	16.07	4.10	11.30	27.37	39.58	1.58	5.58	35.80	0.67
Malt sprouts	11.97	3.75	21.00	11.99	50.00	1.29	16.86	38.35	1.29
Cotton-seed meal	7.59	6.48	44.00	2.77	25.72	13.44	39.07	17.67	13.44

In these experiments two fodders, viz., malt sprouts and cotton-seed meal, were employed which are not in common use among the farmers of this state. Malt sprouts consists of the small sprouts which are broken off from malted barley when

† Landwirthschaftliche Versuchs-Stationen, 27,215.

* Digestible crude fiber and nitrogen-free extract.

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it is dried, mixed with more or less chaff. It contains a large proportion of the valuable protein, and, though produced in somewhat limited quantities, is sold very cheaply. Cotton-seed meal is the ground residue from the preparation of cotton-seed oil. It resembles old-process linseed meal in origin, composition and uses, but contains considerably more protein, being the richest in this ingredient of any of our common fodders. These digestion experiments are not to be regarded as fixing the value of these fodders, although they are an aid in forming a judgment regarding it. They simply show how much of these fodders a ruminating animal is able to dissolve out and take up into his system and how much is excreted unused. How good a use the animal may make of the digested portion will depend largely upon the combination in which it is fed, the individual peculiarities of the animal, and various other conditions. The actual feeding value of an article of cattle food can at present be determined only by actual trial, and then only relatively to other fodders. For example, if we wish to know the value of cotton-seed meal or malt-sprouts as feed for milch cows, we must feed them to milch cows under known and carefully controlled conditions and note the effect upon the milk yields. Moreover, the result, when obtained, will simply show how it compares in value with some other fodder, corn for example. I do not believe that it is possible to say how many pounds of milk, or beef, one hundred pounds of cotton-seed meal, *e. g.*, will produce, because the amount must inevitably vary with varying circumstances, one of the most variable of which is the animal itself. It does appear possible, however, to ascertain how one fodder compares with another in these respects under the same conditions, so that we may know, for example, whether, when other things are equal, cotton-seed meal will produce more or less milk or beef than some other fodder. In the experiments about to be described the attempt has been made to institute such a comparison of cotton-seed meal and malt-sprouts with corn-meal.

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VALUE OF COTTON-SEED MEAL AND MALT SPROUTS AS FEED FOR MILCH COWS.

BY H. P. ARMSBY.

Cotton-seed meal and malt sprouts are fodders which are distinguished, in common with some others, such as oil-meal, gluten-meal, etc., by the large percentage of digestible protein which they contain. It has generally been held to be an established fact that, other things being equal, those rations are most favorable to the production of milk which contain a liberal proportion of digestible protein, such as would result from a judicious use of these and similar fodders. The experiments here described were undertaken for the purpose of further testing this belief.

The general plan of these experiments, and of those described in the preceding paper, originated with the writer. The numerous analyses of milk and butter whose results are reported in this paper were skillfully executed, under the writer's direction, by Mr. A. J. Hilbert, of the class of 1884, while the feeding and care of the cows and the daily churnings were most carefully and conscientiously carried out by Mr. Adams, foreman of the farm.

PLAN OF EXPERIMENTS.

The plan of the experiments was, briefly, the following: In a first period, the cows were fed clover hay and corn meal in such proportions that the ration was relatively rather deficient in protein, containing one part of digestible protein to about eight parts of other digestible matters. The amount of hay fed remained the same throughout the experiments. In a second period, part of the corn meal was replaced by an amount of cotton-seed meal containing the same amount of total digestible matters. The ration as thus altered contained about one part of digestible protein to five and one half parts of other digestible matters. In a third period, malt sprouts were substituted for the cotton-seed meal, the total digestible matters and the

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proportion of protein remaining the same. In a fourth period, the same ration was given as in the first.

In the second and third periods, then, the cows received no more food than in the first and fourth, but the quality of the food differed, that of the second and third periods containing a decidedly larger proportion of protein. If the food showed any influence upon the yield of milk, it must be due to this difference of quality.

ANIMALS AND FODDERS USED.

Three cows were used for the experiments:

NAME.	Breed.	Age.	Calved.	Served.
Jersey	Grade Jersey.	7 years.....	Nov. 4, 1883	Jan. 7, 1884
Brindle*	Native	10 years.....	Jan. 17, 1884	
Yellow.....	Grade Jersey.	10 years.....	Nov. 14, 1883	Jan. 10, 1884

Jersey and Yellow were with calf during the experiments.

The fodders used were those whose composition and digestibility formed the subject of the preceding paper, together with corn meal. As was there stated, four separate samples of the clover hay were analyzed with closely accordant results, thus showing that the sampling was accurate. The composition given in the following table is the average of those four analyses. The amounts of digestible matters are computed from the results of the digestion experiments with sheep except in the case of the corn meal, for which average digestibility is assumed. The clover hay was nearly pure red clover, and of good quality. The malt-sprouts and cotton-seed meal were excellent of their kind. The corn meal was from Waushakum (flint) corn, grown on the University farm.

*The name and dates of this cow as given in Bulletin No. 4 were erroneous.

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Composition of Fodders — Water-free.

	Percentage Composition.					Digestible.		
	Ash.	Protein.	Crude fiber.	Nitrogen-free extract.	Fat.	Protein.	Carbhydrates*	Fat.
Clover	4.89	13.46	32.61	47.16	1.88	6.65	42.65	0.90
Malt sprouts	4.26	23.86	13.63	56.79	1.46	19.16	43.56	1.46
Cotton-seed meal	7.01	47.61	3.00	27.83	14.55	42.28	19.12	14.55
Corn meal	1.91	11.06	1.07	81.27	4.69	8.74	74.62	3.97

* Sum of digestible crude fiber and nitrogen-free extract.

The amount of moisture contained in these fodders as they were weighed out to the cows was also determined, with the following results:

Water-content of Foddcrs.

	Hay.	Corn meal.	Cotton-seed meal.	Malt sprouts.
	Per cent.	Per cent.	Per cent.	Per cent.
Period I	15.55	22.69	.....	.....
Period II	14.94	19.52	9.01	.....
Period III	14.90	18.95	.....	14.90
Period IV	14.46	18.33	.....	.....

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RATIONS FED.

From these data is computed the composition of the rations fed per day as follows:

Rations fed to Jersey.

	Total dry matter.	DIGESTIBLE.		
		Protein.	Carbhydrates.	Fat.
PERIOD I.				
15¼ lbs. hay	12.88 lbs.	0.86 lbs.	5.49 lbs.	0.10 lbs.
9 5/16 lbs. corn meal	7.68 lbs.	0.67 lbs.	5.73 lbs.	0.30 lbs.
Total	20.56 lbs.	1.53 lbs.	11.22 lbs.	0.40 lbs.
PERIOD II.				
15¼ lbs. hay	12.97 lbs.	0.86 lbs.	5.54 lbs.	0.10 lbs.
7¼ lbs. corn meal	6.24 lbs.	0.55 lbs.	4.66 lbs.	0.25 lbs.
1 1/16 lbs. cotton-seed meal	1.71 lbs.	0.72 lbs.	0.33 lbs.	0.25 lbs.
Total	20.92 lbs.	2.13 lbs.	10.53 lbs.	0.60 lbs.
PERIOD III.				
15¼ lbs. hay	12.98 lbs.	0.86 lbs.	5.54 lbs	0.10 lbs.
4 7/16 lbs. corn meal	3.60 lbs.	0.31 lbs.	2.69 lbs.	0.14 lbs.
4 1/16 lbs. malt sprouts	4.15 lbs.	0.80 lbs.	1.81 lbs.	0.06 lbs.
Total	20.73 lbs.	1.97 lbs.	10.04 lbs.	0.30 lbs.
PERIOD IV.				
15¼ lbs. hay	13.04 lbs.	0.87 lbs	5.56 lbs.	0.10 lbs.
9 1/16 lbs. corn meal	8.11 lbs.	0.71 lbs.	6.05 lbs.	0.32 lbs.
Total	21.15 lbs.	1.58 lbs.	11.61 lbs.	0.42 lbs.

The rations for the other two cows were slightly less in quantity but exactly the same in quality. The feed was given in two feeds, was eaten clean throughout the trials, but was apparently all that the animals would have eaten clean.

As before stated, it was intended to make the amount of total digestible matter the same in each period; but it will be seen that this intention was not exactly realized. The

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following summary shows this more clearly. By "Nutritive ratio" is meant the ratio of digestible protein to digestible carbhydrates and fat taken together.

Summary of Composition of Rations.

	JERSEY.		BRINDLE AND YELLOW.	
	Total digestible matter.	Nutritive Ratio.	Total digestible. matter.	Nutritive Ratio.
Period I.....	13.71 lbs.	1 : 8.0	13.34 lbs.	1 : 8.0
Period II.....	14.10 lbs.	1 : 5.6	13.66 lbs.	1 : 5.6
Period III.....	12.73 lbs.	1 : 5.5	12.34 lbs.	1 : 5.5
Ferlod IV.....	14.20 lbs.	1 : 8.0	13.71 lbs.	1 : 8.0

The variations in the total amount of nutritive matter from one period to another are due partly to differences in the amount of moisture in hay and corn-meal, but chiefly to the fact that these experiments were begun before the results of the digestion experiments were fully worked out so as to be available in fixing upon the amounts of hay, meal, etc., required to make up the desired ration.

In calculating these rations it has been assumed that the cows digested the fodder to the same extent as the sheep. While it is not likely that this is *exactly* the case, it appears safe to assume that the variation was not large. Moreover, whatever difference existed is likely to have been essentially the same in all the periods, so that it will not materially affect the comparison of one period with another.

CONDUCT OF EPERIMENTS.

Each period extended over three weeks, except period III, which included only two weeks. The determinations mentioned below were made on every day of the experiments, but only the *daily average* for the *last two weeks* of each period (or, in case of period III, for the last week) is given. The full effect of a change of fodder is not realized at once; hence the necessity for a preliminary feeding, and for con-

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tinuing the same feeding for a considerable time. Three weeks is none too long, and four would have been better had time allowed.

Each cow's feed was weighed out separately for each day, in bags, a week's feed at a time, samples being taken at the some time for determination of moisture. The hay had been previously cut fine for convenience of sampling, as described in the foregoing article. When fed, the meal was sprinkled upon the hay, all being fed dry except the malt sprouts, which were soaked in 25 pounds of cold water.

The cows were milked twice daily, the milk being at once weighed. In addition to the quantity of milk produced, its quality was also determined in two ways; by chemical analysis and by churning tests.

The cows were watered twice daily at the same hours, with water at 50° F., of which they drank all they chose. They were also weighed each day at the same hour. The temperature of the stable was noted each day at 7 A. M., 2 and 9 P. M., and the average of these three taken to represent the average daily temperature. On every pleasant day the cows were let out for exercise during the afternoon, in a lot where they could get no fodder.

QUANTITY OF MILK PRODUCED.

Before proceeding to consider the effect of the rations upon the quantity of milk produced, it will be necessary to take account of the possible effects of other conditions, for the yield of milk is liable to be affected by many circumstances besides the food. We can safely attribute any variation to the change of food only when we are able to show that it can be due to nothing else. The necessary data concerning the more important of these conditions are to be found in the following table, in which are given the averages of the last two weeks (or one week, in Period III) of each period:

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Period.	Live Weight.	Water Drunk.	Temperature of stable.
JERSEY.			
I.....	849 lbs.	79.0 lbs.	27.9° F.
II.....	861 lbs.	82.6 lbs.	41.2° F.
III.....	878 lbs.	89.7 lbs.*	46.4° F.
IV.....	874 lbs.	88.7 lbs.	58.3° F.
BRINDLE.			
I.....	843 lbs.	78.1 lbs.	27.9° F.
II.....	825 lbs.	78.1 lbs.	41.2° F.
III.....	842 lbf.	82.7 lbs.*	46.4° F.
IV.....	821 lbs.	90.0 lbs.	58.3° F.
YELLOW.			
I.....	875 lbs.	74.3 lbs.	27.9° F.
II.....	871 lbs.	78.8 lbs.	41.2° F.
III.....	895 lbs.	89.0 lbs.*	46.4° F.
IV.....	875 lbs.	80.2 lbs.	58.3° F.

* Including twenty-five pounds used to soak the malt sprouts.

Neither the average live weights nor the daily weighings show any marked tendency toward a gain or loss in any period, thus indicating that the animals neither drew upon their bodies to make milk nor fattened at the cost of lessened milk-production. The water drunk varies somewhat, increasing, as was natural, as the weather became warmer. A careful study of the daily consumption, however, fails to show any definite relation between it and the temperature, the live weight, or the milk produced.

The temperature of the stable increased from period to period, and it is well established that this, of itself, would have a tendency to increase the flow of milk. At the same time, however, as the cows advanced in lactation the tendency would be toward a falling off in the milk, and these two tendencies would, to a certain extent, neutralize each other. It will be remembered that the rations in the first and last periods were made the same. This was done in order to show how much the milk yield had fallen off during the intervening periods. It is assumed that, if the same feed had been continued throughout the experiment, the milk

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yield would have fallen off regularly. The regular rise in temperature partly counterbalanced this falling off, and the difference in yield between the first and last periods expresses the difference between these two effects.

Thus Brindle gave, in period I, 29.16 lbs. of milk; and in period IV, on the same feed, 24.84 lbs. The falling off of 4.32 lbs. is due to the natural shrinkage in milk, modified by the influence of higher temperature. From the middle of period I to the middle of period IV was eight weeks. If, then, the feed had remained the same, we may assume that the daily yield of milk would have fallen off 0.54 lb. per week. Up to the middle of the second period, that is, after three weeks, the daily yield would have fallen off 1.62 lbs., making it 27.54 lbs. per day. Under the influence of the ration actually fed, however, the daily yield was 28.96 lbs., which, though less than in the first period, is greater by 1.42 lbs. than we have reason to think it would have been if the feed had not been changed. It thus appears that the change of feed resulted in a gain, although if we had not been able to compute the rate at which the yield was falling off, but had compared the two periods directly, we should have concluded that the change of feed had resulted in a loss.

A similar calculation to that just detailed has been made for each cow for each period, and in the following table the actual and computed yields are compared. The difference between the two shows the gain (+) or loss (—) caused by the change of feed.

Milk Yields.

Period.	Date.*	Jersey.			Brindle.			Yellow.		
		Computed.	Observed.	Difference.	Computed.	Observed.	Difference.	Computed.	Observed.	Difference.
		lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
I.	Feb. 27–Mch. 18	18.88	18.88	.....	29.16	29.16	.....	19.67	19.67	.....
II.	Mch. 18–Apr. 8	18.86	19.84	+0.98	27.54	28.96	+1.42	19.84	19.88	+0.04
III.	April 8–22. ...	18.84	18.24	−0.60	26.19	25.96	−0.23	19.98	20.48	+0.50
IV.	Apr. 22–May 13	18.82	18.82	.....	24.84	24.84	.....	20.12	20.12	.....

* Whole period.

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It may be noted in passing that Yellow gave more milk in the last period than in the first, probably on account of the higher temperature.

Brindle, as will be seen, gave a rather large yield of milk, while Jersey and Yellow, on the other hand, gave only a moderate amount. Thus we have a test of the effect of the several rations upon two moderate milkers and one very good one; and it is to be noted that the effect was, on the whole, essentially the same in all three cases, differing only in amount. A comparison of the three cows with each other shows very pointedly how entirely a secondary matter is the feed as compared with a proper choice of animals. Brindle, on slightly less feed than Jersey, and the same as Yellow, produced about one and one-half times as much milk, simply because her organization was such that she could work over a larger proportion of her feed into milk. On the other hand, it must be placed to the credit of the other two cows that they did not shrink in milk to any extent during the experiment, while Brindle did so very materially. Only a comparison extending through a whole milking season could settle which was the most valuable animal for milk, but nevertheless our results furnish food for reflection regarding the importance of a proper selection of milch cows.

Coming now to a consideration of the relations of feed to milk, we observe that in every case the ration of period II shows more or less gain over that of periods I and IV, while the ration of period III shows a loss in every case but one. The weight of the milk, however, does not always furnish a correct measure of the real effect of the feed, because it may be more watery in one period than another. In fact Jersey's milk was more watery in the second period than in the first, thus accounting for part of the apparent gain, and it is quite possible that the same was true of Brindle's milk also. A juster basis of comparison is furnished by the amount of solid matter contained in the milk, since this is its valuable portion. In the case of Jersey, we have determinations of this.

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Yield of Milk-solids—Jersey.

Period.	Date.	Milk-Solids.		
		Computed.	Observed.	Diff.
I..... ...	Feb. 27–March 18...	2.666 lbs.	2.666 lbs.	.....
II.....	Mar. 18–April 8.....	2.614 lbs.	2.712 lbs.	+0.098 lbs.
III.....	Apr. 8–22.....	2.576 lbs.	2.464 lbs.	—0.112 lbs.
IV.....	Apr. 22–May 13.....	2.544 lbs.	2.544 lbs.	.....

These figures confirm the conclusions drawn from the yields of fresh milk, viz.: that period II shows a gain and period III in general a loss, as compared with the clover hay and corn meal ration of periods I and IV.

In the case of Jersey, where we have the necessary data for a just comparison, we find that the gain in period II is somewhat less than the loss in period III, the two corresponding respective to 0.75 pounds and 0.86 pounds of milk with 13 per cent. of solids. Brindle's fresh milk shows a gain in period II greater than the loss in period III, and Yellow's shows practically no gain in period II but a *gain* of 0.50 pounds in period III. As we have, however, no means of knowing how much of these gains and losses was due to variations in the amount of water in the milk, we shall be safer if we consider chiefly the results obtained on Jersey.

What relation, now, can be traced between the gain or loss in the several periods and the rations fed? The point which was to be tested, it will be remembered, was, what effect has an increase of the proportion of digestible protein in a ration upon milk production? This it was sought to solve by increasing the proportion of protein in periods II and III, from one part in eight to one part in five and one-half. The result in Jersey's case is a small gain in period II and a small loss in period III. The only conclusion that can be drawn is, that increasing the proportion of protein in the ration by substituting cotton-seed meal or malt sprouts for corn meal, had no effect upon the production of milk. The differences observed are readily explained in another

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way. A reference to the table on page 82 shows that the amount of total digestible matters was unintentionally increased somewhat in period II and diminished again in period III, and the yield of milk corresponds to the variations in the total amount of food digested, rather than to the variations in the proportion of protein.*

Another influence tending in the same direction is that of temperature. It has been assumed in comparing the observed and computed yields, that the temperature of the stable increased uniformly from period to period. This is not exactly the case, the temperature being 3.2° above the assumed average in period II and 1.7° below it in period III, thus tending to increase the yield in period II and to diminish it in period III.

The result was somewhat unexpected, but it is quite in the line of recent physiological investigations (by Rubner) into the relative value of protein, fat and carbhydrates. Moreover, it is only in seeming conflict with other experiments upon milk production. All experiments of which I have been able to find any record which appear to show the importance of protein in milk production have been made by adding some nitrogenous fodder, like oil-meal, to a poor ration, thus increasing not only the protein but also the total digestible matters. These results simply indicate that the same advantage might have been gained in those experiments by adding to the poor ration an equivalent quantity of some fodder containing less protein — corn meal for instance.

This conclusion, if confirmed by subsequent experiments, is a very important one. If the yield of milk depends, so far as feed is concerned, chiefly upon the *amount* of the latter which is digested, and not upon the proportion of protein, then a fodder is valuable for milk production simply in proportion to the total amount of digestible matter it contains. Then fodders like bran, middlings, corn meal, etc., which con-

*It should, perhaps, be noted that the ration in period IV is a little better than in period I, and this would affect somewhat our calculations of the rate at which the milk yield fell off, but it would not materially alter the main result of the experiments.

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tain only a moderate proportion of protein, are nearly as valuable for milk production as the more costly oil-meals and other more nitrogenous feeding stuffs. This, if confirmed, is particularly interesting as regards Indian corn. This crop is, and must long continue to be, the main reliance of the feeder in this region. Good corn meal contains not far from seventy per cent. of digestible matters, and cotton-seed meal about the same amount. Corn meal, however, is not rich in protein, while cotton-seed meal is, and hence a special value has been attributed to the latter as a means of increasing the proportion of protein in a ration. But if, as these experiments indicate, it is of no advantage to increase it above a certain moderate amount, the cotton-seed meal is of no more value than the corn meal, and the farmer may use the cheap home grown feed instead of the more expensive imported material, at least if he has good hay or clover to form the basis of the ration. Essentially the same would be true of other varieties of oil meal.

Malt sprouts, according to the determination reported above, contain about fifty-seven per cent. of digestible matters, and hence, if the experiments are correctly interpreted, would be worth about fifty-seven seventieths, or, in round numbers, six sevenths, as much as corn meal, pound for pound. At present they can be bought, near large breweries, considerably below that price, and they appear to be an excellent food for milk production. They cannot, however, be recommended to butter makers, as they impart their flavor to the cream and butter.

It should be observed that the above statements regarding the relative values of feeding-stuffs are only true *if* our interpretation of our experimental results is true, and not otherwise. They are introduced here simply to show the practical bearings of the experiments.

QUALITY OF MILK.

As already stated, the quality of the milk produced in the experiments was determined daily by chemical analysis and by churning tests.

A sample of Jersey's milk was taken every night and

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morning, the two samples mixed, and in the mixed night's and morning's milk the percentage of the total solids and of fat was determined. The remainder of Jersey's and all of Brindle's milk was set in small Cooley cans immersed in ice water, the temperature of milk and of water being noted. After eleven hours the skim milk was drawn off, a sample of it taken for analysis, and the cream weighed and set aside to ripen. The cream from the morning's milking was added to that from the previous night's milk, and the whole, after standing thirty-six hours, during which time it became slightly sour, was churned in a rectangular churn. The butter was well worked, and weighed before salting. A sample of Jersey's butter was taken each day for analysis.

Taking first the quality of Jersey's milk as shown by analysis, we have the following results:

Total Solids and Fat.—Jersey's Milk.

	Total Solids. Per Cent.	Fat. Per Cent.
Period I	14.12	4.52
Period II	13.67	4.16
Period III	13.50	4.03
Period IV	13.52	3.84

The percentage of both total solids and fat decreased more or less regularly as the experiments advanced, independently of feed. In the case of the fat the decrease was very regular; in that of the solids it nearly all took place between the first and second periods. A study of the daily results shows that the falling off in the percentage of total solids actually occurred about the middle of the first period, the greater richness of the milk before that time raising the average above that of the other periods. There are no indications that the food influenced essentially the composition of the fresh milk.

It is of interest, also, to compute what proportion of fat the milk would have contained had its proportion of water been the same in each period. It is easy to calculate from

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the above figures that if, in all the periods, the milk had contained twelve per cent. of total solids and eighty-eight per cent. of water (the standard commonly adopted for such calculations), the percentage of fat would have been as follows:

Period I..... 3.84 per cent.
Period II..... 3.65 per cent.
Period III..... 3.58 per cent.
Period IV..... 3.42 per cent.

The proportion of fat to other solid matters is shown to decrease as the experiments progressed, but this was evidently due to a gradual alteration in the character of the milk with advancing lactation, and not, so far as appears, to the changes in the fodder.

The average daily yield of milk solids has already been given; I repeat it here, however, in connection with a similar statement for the total milk-fat produced. It will be seen that the production of fat was affected by the feed in the same way as that of the fresh milk and the milk solids.

Yields of Milk-solids and Fat (Jersey).

PERIOD.	MILK-SOLIDS.			MILK-FAT.		
	Computed	Observed.	Difference	Computed	Observed.	Difference
I.....	2.666 lbs.	2.666 lbs	.....	0.854 lbs.	0.854 lbs.	.....
II.....	2.614 lbs.	2.712 lbs.	+0.098 lb.	0.804 lbs.	0.824 lbs.	+0.020 lbs
III.....	2.576 lbs.	2.464 lbs.	−0.112 lbs	0.764 lbs.	0.735 lbs	−0.029 lbs
IV.....	2.544 lbs.	2.544 lbs.	.....	0.729 lbs	0.729 lbs.	.....

Of more practical interest than the chemical composition of the milk, however, are the determinations of the amount of butter obtainable by churning, since that portion of the fat of the milk which is convertible into butter by the ordinary manipulation has a far higher value than that which remains in the skim-milk and buttermilk. The question whether any given fodder affects the churning qualities of the milk is a highly important one, for, should it affect them unfavorably, for example, this alone might more than coun-

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terbalance any increase in the total number of pounds of milk produced. It is, moreover, a question not easy to solve with certainty. Chemical analysis of the milk throws no light upon it, and the operations of setting milk and churning the cream it is difficult to conduct with the desirable degree of accuracy. We are perhaps justified in thinking that the large number of single trials represented by the following averages, each made with every precaution to secure uniformity of conditions, will compensate for the errors incident to a single trial, and yield trustworty results. I present the figures for what they are worth, hoping to test them by subsequent experiments.

A general notion of the butter-making quality of the milk is obtained by noting the number of pounds of milk required to make a pound of butter.

Milk Per Pound of Butter.

	Jersey.	Brindle.
Period I	22.6 lbs.	24.8 lbs.
Period II	26.0 lbs.	24.0 lbs.
Period III	25.6 lbs.	23.2 lbs.
Period IV	23.8 lbs.	22.1 lbs.

It appears that the milk of each cow was of good quality as regards the yield of butter, and that the rather small amounts of butter credited to Jersey below are due to small quantity and not to poor quality of milk.

The quality of Brindle's milk, as measured by this standard, improves regularly from period to period, apparently quite independently of the food. Comparing the first with the fourth period, Jersey's milk shows a slight falling off in quality, corresponding to that shown by chemical analysis, p. 90. In periods II and III, however, the quality of the milk falls off in a way that can be explained only by supposing that the feed affected the churning qualities of the milk.

The follcwing table shows the same thing in another way.

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In it are compared the actual and the computed (see p. 85) yields of butter, butter-solids (*i. e.*, butter freed from water), and pure butter-fat by Jersey and the actual and computed yields of butter by Brindle. The amounts are given in ounces.

Average Daily Yields.

PERIOD.	JERSEY.						BRINDLE.	
	Butter.		Butter-solids.		Butter-fat.		Butter.	
	Comp.	Obs.	Comp.	Obs.	Comp.	Obs.	Comp.	Obs.
	oz.	oz.	oz.	oz.	oz.	oz.	oz.	oz.
I	13.36	13.36	11.41	11.41	11.27	11.27	18.80	18.80
II	13.10	12.21	11.19	10.66	11.01	10.44	18.59	19.32
III.	12.78	11.41	11.00	9.85	10.78	9.63	18.33	17.88
IV.....	12.66	12.66	10.82	10.82	10.55	10.55	17.97	17.97

Brindle's yield of butter shows a gain in period II and a loss in period III as compared with the computed yield, corresponding in this respect to the effect of the feed upon the quantity of the milk. In Jersey's case, however, the yields in the second and third periods fall very decidedly below the computed yields, whether we take as a basis of comparison the weight of fresh butter, of butter-solids, or of butter-fat, thus showing again that the churning quality of the milk was in some way affected in these periods.

A third method of computing the results shows still more plainly how Jersey's milk was affected. The *fat* of the milk is, to the butter maker, its valuable constituent, and it is easy from the data at our command to ascertain what proportion of the fat of the milk was recovered in the butter in each period and what proportion remained in the skim-milk and buttermilk. The following table shows this in a condensed form :

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Distribution of Fat of Milk (Jersey).

PERIOD.	In Butter. Per cent.	In Skim-milk. Per cent.	In Buttermilk. (By difference.) Per cent.
I.....	82.50	8.35	9.15
II.....	79.15	5.91	14.94
III.....	81.89	6.21	11.81
IV.....	91.27	5.80	2.93

These figures signify that, for example, in period I, 82½ per cent. of the whole amount of fat contained in the milk was recovered in the butter, while 17½ per cent. of it remained in the skim-milk and buttermilk. Comparing, now, the several periods, it is obvious that a smaller proportion of the milk fat was recovered in periods II and III than in the average of periods I and IV. Furthermore, we find that the proportion lost in the skim-milk does not vary much from period to period, but that the loss in periods II and III was in the buttermilk. In other words, the cream rose equally well in all the periods, but churned better in periods I and IV.

This corresponds with observations made at the time of churning. Brindle's cream showed no notable differences and was churned throughout at 59° F. Soon after entering upon period II, however, Jersey's cream began to occupy more time in the churning, and at the same time the butter grew harder, so that it was almost impossible to "gather" it, and it became necessary to raise the temperature from 59° F. to 62.5° F., in order to get a satisfactory churning. This temperature was continued through periods II and III, but as soon as the animals returned to the clover hay and corn meal, in period IV, this temperature proved to be too high, and had to be reduced to 59° F., again.

It is possible, though it does not appear probable, that a further increase in temperature in the second and third periods might have caused a better yield of butter. But however that may be, it is certainly of interest to note that the same change of feed affected the quality of the milk in

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this respect very decidedly in one animal and hardly at all in another, under the same conditions.

These comparisons and deductions should not be pushed too far, for such trials are subject to many sources of error, owing to the numerous and complex conditions involved. They certainly, however, fail to show any *improvement* in the churning qualities of the milk resulting from the use of cotton-seed meal or malt sprouts.

In conclusion, it should be stated expressly that these results and considerations are presented simply as the teachings of this single feeding trial, and furthermore, that some of the most important conclusions are largely based on results obtained with one animal (Jersey) while it is uncertain whether those upon the other two confirm them. In short, this experiment is to be regarded as a preliminary experiment: as pointing out a promising direction for future work rather than itself establishing anything. More extended and accurate experiments are now in progress, designed to test the indications of this one. Until these are completed it will be well to suspend judgment upon the relative merits of oil-meal compared with corn meal.

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MISCELLANEOUS CHEMICAL AND OTHER WORK.

BY H. P. ARMSBY.

During the year 1884, the work of the chemical laboratory of the Station has consisted chiefly of the execution of the numerous analyses of fodders, dung, milk, skim-milk and butter required in the foregoing feeding experiments. Complete or partial analyses were made of fifty-five different samples of fodder, forty-six samples of dung, and seventy samples each of milk, skim-milk and butter.

In addition, some other work has been done, part of which is reported in the following pages.

ANALYSES OF MILK.

The chemist is frequently called upon to determine whether a sample of milk has been adulterated. If any foreign substance has been added, its detection is usually an easy matter. When, however, as is commonly the case, the adulteration consists in the simple addition of water, removal of cream, or both, the fraud can only be detected by comparing the composition and properties of the sample in question with those of pure milk.

Various short methods of testing milk are in use, but the only sure means of determining its quality is chemical analysis. By a comparison of the percentages of total solid matters and fat and of the specific gravity with those of pure milk, it is possible, in the majority of cases, to say whether or not milk has been skimmed or watered or both. For this purpose, however, it is plainly essential that we should know what the composition and specific gravity of pure milk are. These are by no means always the same, but vary, more or less, from cow to cow and from herd to herd, and in the same cow or herd at different times. Consequently it is important that we should know how great those variations are and within what limits they range.

The following analyses were made in the laboratory of the Station by Mr. A. J. Hilbert, in the preparation of a thesis

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for special honors, and are published here as a contribution to our knowledge of the composition of such milk as is produced in this state.

Milk of Single Cows.

NUMBER.	Total solids.	Fat.	Specific gravity.
	Per cent.	Per cent.	
1	14.63	4.96	1.032
2	13.57	3.86	1.032
3	15.18	4.59	1.033
4	16.43	6.03	1.032
5	14.69	4.31	1.032
6	13.39	4.22	1.031
7	16.74	6.35	
8	14.31	4.59	
9	12.97	4.21	1.029
10	12.96	3.06	1.034
11	12.89	3.24	1.032
12	14.03	4.64	1.035
13	14.06	4.18	1.034
14	11.72	2.67	1.029
15	12.10	3.82	1.033
16	13.94	3.84	1.032
17	16.40	7.29	1.018
Average	14.10	4.46	1.031
Highest	16.74	7.29	1.018
Lowest	11.72	2.67	1.035

Herd Milk.

NUMBER.	Total solids. Per cent.	Fat. Per cent.	Specific gravity.
1	16.39	7.61	
2	13.86	4.53	1.030
3	13.15	3.95	1.021
4	15.31	5.82	1.030
5	14.51	4.84	1.029
6	13.07	4.21	1.030
Average	14.38	5.16	1.028
Highest	16.39	7.61	1.030
Lowest	13.07	3.95	1.021

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University Herd.

DATE.	Total solids. Per cent.	Fat. Per cent.
April 8, 1884	12.64	3.90
April 9, 1884	12.78	3.73
April 10, 1884	12.93	3.76
April 11, 1884	12.46	3.73
April 12, 1884	12.82	3.99
Average	12.73	3.80
Highest	12.93	3.99
Lowest	12.46	3.73

From this comparatively small number of analyses it is hardly possible to draw any trustworthy conclusions as to the average quality of pure milk as produced in Wisconsin. Unfortunately, also, the records of the breed of the cows or herds have been lost. It is evident, however, that the most of our milk is decidedly above the legal standards adopted in many other states. Without entering into details, it may be said that these standards assume about 12 per cent. of the total solids and 2.5 per cent. of fat, and a specific gravity of 1.029 as the limit below which a milk shall be considered as adulterated. The lowest percentages here found are decidedly above this limit in every case but one, while the averages are much above them.

In the following table are given a few analyses of Madison market milk, presumably unadulterated. These also show much higher percentages than the legal minimum just mentioned:

Analyses of Madison Market Milk.

NUMBER.	Total Solids. Per Cent.	Fat. Per Cent.	Specific Gravity.
1	14.68	5.10	.....
2	12.86	3.76	1.030
3	14.68	5.10	.....
4	15.09	5.85	1.029
5	12.71	4.29	.....
6	12.39	3.42	1.038
7	12.53	3.00	1.036
Average	13.42	4.36	1.033
Highest	15.09	5.85	1.038
Lowest	12.39	3.00	1.029

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The following table of 32 analyses of Milwaukee market milk shows the milk furnished to that city to be of good quality in most cases; several of the samples, however, have probably been tampered with, and No. 27 is obviously skim-milk:

Milwaukee Market Milk.

NUMBER.	Total Solids.	Fat.	Specific Gravity.
	Per cent.	Per cent.	
1	9.66	2.02	.....
2	11.40	3.11	.....
3	11.82	2.97	.....
4	11.96	3.34	.....
5	13.51	3.87	.....
6	12.02	3.26	1.028
7	13.37	4.24	1.031
8	12.82	3.83	1.031
9	11.52	2.25	1.032
10	12.54	3.22	1.030
11	11.49	2.37	1.032
12	11.82	3.22	.....
13	13.50	4.27	1.030
14	11.70	2.87	1.026
15	11.85	2.09	1.032
16	12.52	3.03	1.032
17	15.44	6.50	1.028
18	12.03	2.05	1.032
19	12.05	2.65	1.033
20	13.17	4.58	1.029
21	10.77	2.91	1.016
22	10.47	2.61	1.024
23	13.07	4.19	1.031
24	13.08	4.22	.....
25	12.38	4.44	1.027
26	12.47	3.48	1.032
27	9.69	.83	1.025
28	12.43	3.24	1.032
29	9.92	1.96	1.027
30	13.30	3.31	1.033
31	13.71	4.29	1.030
32	12.32	.....	1.030
Average	11.87	3.26	1.028
Highest	15.44	6.50	1.033
Lowest	9.69	.83	1.016

INSTRUMENTS FOR SYRUP AND SUGAR MAKING.

In the manufacture of sugar and syrup from sorghum, an important requisite for uniform and successful working is the use of proper instruments for testing the percentage of

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sugar in juice or syrup. For those who work on a comparatively small scale, as is the case with most of the manufacturers in this state, and who cannot afford to employ the technical skill which is necessary for the use of accurate chemical or optical methods, the most available instruments are the thermometer and the hydrometer.

As stated in the last annual report of this Station, a number of these instruments, after having been carefully tested, were sold by the station during the fall of 1883 at cost to makers of syrup and sugar. In July, 1884, the following circular was sent to all syrup or sugar makers in the state whose addresses were known:

UNIVERSITY OF WISCONSIN.
Agricultural Experiment Station.
MADISON, WIS., July, 1884.

DEAR SIR:—This station offers its services as agent to such makers of sugar and syrup in the state as may desire to procure accurate thermometers and hydrometers, on the following terms:

The station will receive all orders which are sent in before August 1, 1884, will purchase the instruments, test them, and distribute them at cost price plus the actual expenses incurred. When the instruments are ready for distribution they will, unless instructions to the contrary are sent with the order, be sent by express, C. O. D., to the office nearest the purchaser.

The cost of the instruments will not exceed the following amounts:

Thermometer	$2 00
Set of three Brix hydrometers	3 00
Litmus paper, per quire	1 00
Litmus paper, per sheet	05

Address all communications to

PROF. H. P. ARMSBY,
Madison, Wis.

In response to the circular a number of orders were received, which were filled early in September.

SORGHUM JUICE.

Analyses of the juice of several varieties of sorghum grown on the University farm were made during the fall of 1884. The juice was expressed from the cane by means of a small hand press, and its content of sucrose and glucose determined by Collier's method (Rept. U. S. Dept. of Agriculture, 1879, p. 65.). The results of these analyses and all particulars con-

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cerning the varieties, etc., etc., will be found in Prof. Henry's report on page 32.

FERTILIZER ANALYSIS.

Hitherto Wisconsin farmers have very seldom felt the necessity of supplementing their home supply of fertilizing materials by the purchase of artificial fertilizers. This is largely the case to day, but as the fertility of the farming land of the state becomes gradually exhausted by the export of the products of the soil and by wasteful systems of farming, the demand for outside aid to restore that fertility will become more general. Already the consumption of commercial fertilizers in the state is increasing and it will doubtless continue to increase.

This is not the place for a discussion of the value of such fertilizers in agriculture, or of the best methods of using them, but as the Station has already been called upon in a few cases to examine and pronounce upon the quality of these materials, a brief statement of the uses of the chemical analysis of fertilizers, and of the precautions necessary in order that the results may not be misleading, will not be out of place.

Hardly any articles of trade are more easily adulterated than commercial fertilizers, and in hardly any is it more difficult to detect falsification by simple inspection. Even the grossest frauds in these articles may entirely escape the notice of the purchaser. By the help of chemical analysis, however, it is possible to determine the amount of valuable matter in a fertilizer, and to tell with a reasonable degree of accuracy whether it is worth the price asked for it.

As stated on p. 10, the Station is prepared to make such analyses gratuitously for citizens of Wisconsin on certain conditions. But as the making of such analyses involves no little labor and expense (the usual charge for fertilizer analysis varying from $10 to $50 or more according to the nature of the fertilizer), the Station feels justified in insisting rigidly upon compliance with those conditions. The propriety of the second and third conditions, viz.: that the results must be likely to be of use to the public, and that

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the Station shall have full liberty to use the results as it sees fit, is very evident when it is considered that the Station is in effect supported out of the public funds. A few words may, perhaps, be added here with regard to the first condition, viz., that samples must be taken in accordance with the Station's instructions.

These instructions are as follows:

INSTRUCTIONS FOR SAMPLING COMMERCIAL FERTILIZERS.

The *commercial value* of a high priced fertilizer can be estimated, if the percentages of its principal fertilizing elements are known. Chemical analysis of a small sample, so taken as to fairly represent a large lot, will show the composition of the lot. The subjoined instructions, if faithfully followed, will insure a fair sample. Especial care should be observed that the sample neither gains nor loses *moisture* during the sampling or sending, as may easily happen in extremes of weather, or from even short exposure to sun and wind, or from keeping in a poorly closed vessel.

1. Provide a tea cup, some large papers, and for each sample a glass fruit jar, holding about one quart, that can be tightly closed, all to be clean and dry.

2. Weigh separately at least three (3) average packages (barrels or bags) of the fertilizer, and enter these *actual weights* in the "Form for Description of Sample."

3. Open the packages that have been weighed, and mix well together the contents of each, down to one-half its depth, emptying out upon a clean floor if needful, and crushing any soft, moist lumps in order to facilitate mixture, but leaving hard, dry lumps unbroken, so that the sample shall exhibit the texture and mechanical condition of the fertilizer.

4. Take out five (5) equal cupfuls from different parts of the mixed portions of each package. Pour them (15 in all) one over another upon a paper, intermix again thoroughly but quickly to avoid loss or gain of moisture, fill a jar from this mixture, close tightly, *label plainly*, and send charges prepaid, to

AGRICULTURAL EXPERIMENT STATION,
Madison, Wisconsin.

The object of these instructions is to insure that the sample sent shall be a fair representative of the lot sampled.

The Station also furnishes the following:

FORM FOR DESCRIPTION OF SAMPLE.

Station No.....Received at Station.....18...

Each sample of Fertilizer sent for gratuitous analysis must be accompanied by one of these forms, with blanks *below* filled out fully and legibly.

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The filled out form, if wrapped up with the sample, will serve as a label.

Send with each sample a specimen of any printed circular, pamphlet, analysis, or statement that accompanies the fertilizer or is used in its sale.

Brand of Fertilizer.....

Name and address of Manufacturer.....

.....

Name and address of Dealer from whose stock this sample is taken.....

.....

Date of taking this sample.....18..

Selling price per ton or hundred, bag or barrel.....

Selling weight claimed for each package weighed.....

Actual weight of packages opened.....

Here write a copy of any analysis or guaranteed composition that is fixed to the packages.

.....

.....

.....

Signature and P. O. address of person taking and sending sample.

.....

.....

The filled up form is preserved in the records of the Station along with the analysis of the fertilizer, and serves as a voucher for the authenticity of the sample.

One needs but little reflection to perceive the necessity that the Station is under of using every means to insure the genuineness and fairness of the samples examined by it. The profitable manufacture of fertilizers requires the investment of considerable capital and the building up of a reputation for honesty and fair dealing. The publication of a single analysis reflecting on the quality of the goods might work great damage to innocent parties. On the other hand, if the samples were better than the goods, as great or greater damage might be done to purchasers.

The above instructions are intended to secure fair sampling. In justice both to himself and to the maker, the consumer should take his samples *immediately on receipt of the goods,* as small lots of fertilizers are liable to change somewhat in value on standing, frequently to the advantage of the maker, especially if contained in bags. Moreover, such samples when taken should be sent to the Station *at once,* in order that if they are liable to further change they may

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be properly preserved. Samples should always be placed in *air tight* vessels, of *glass* if possible. Superph osphates, particularly, should never be sent in metallic vessels.

In general, fertilizers should be bought upon a guarantee as to the amount of valuable substances which they contain. High-priced fertilizers (these costing from $30 to $80 per ton, or more) depend for their trade value upon the amounts of three substances which they contain, viz.: nitrogen, potash and phosphoric acid, the latter in the 3 forms of "soluble," "reverted" and "insoluble." Reputable manufacturers will always guarantee their fertilizers to contain certain amounts of these substances, and the payment for the goods should be made to depend upon the fulfillment of the guarantee.

Still better would it be if all fertilizers were bought, as they are in the wholesale trade, on the basis of chemical analysis. On this plan, the buyer of a ton of fertilizer would agree to pay, not so many dollars for the ton as a whole, but so many cents per pound for every pound of nitrogen, phosphoric acid and potash which that ton contained as shown by a chemical analysis. For example, let us suppose the fertilizer to be a dried blood and that the agreement is that the price of the nitrogen which it contains shall be eighteen cents per pound, and of the phosphoric acid six cents per pound. A chemical analysis shows that the sample contains.

Nitrogen	10 per cent.
Phosphoric acid	4 per cent.

One ton (2000 lbs.) would, then, contain 200 lbs. of nitrogen and 80 pounds of phosphoric acid. These, at the above prices, would amount to $36 for the nitrogen and $4.80 for the phosphoric acid, or together $40.80 for the ton of fertilizer, and this price would be paid accordingly.

The advantages of this method of buying are that the buyer pays for the valuable elements of the fertilizer, that he pays for exactly what he gets and knows exactly what he gets, and that he is able to compare directly the prices asked by different dealers. The method is advantageous to

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both buyer and seller, and the Station will gladly aid, to the extent of its power, all desirous of buying or selling in accordance with it. The following table of trade values may also be of aid to any such.

The average market prices per pound of the ordinarily occurring forms of nitrogen, phosphoric acid and potash as found in eastern markets in the spring of 1885 are the following:

TRADE VALUES OF FERTILIZING INGREDIENTS IN RAW MATERIALS AND CHEMICALS.

	Cents.
Nitrogen in ammonia salts	18
Nitrogen in nitrates	18
Nitrogen in dried and fine ground fish	18
Organic Nitrogen in guano, dried and fine ground blood and meat	18
Organic Nitrogen in cotton seed and linseed meal and in castor pomace	18
Organic Nitrogen in fine ground bone	18
Organic Nitrogen in fine medium bone	16
Organic Nitrogen in medium bone	14
Organic Nitrogen in coarse medium bone	12
Organic Nitrogen in coarse bone, horn shavings, hair and fish scrap	10
Phosphoric Acid, soluble in water	9
Phosphoric Acid, soluble in ammonium citrate	8
Phosphoric Acid, insoluble, in dry fine ground fish and in fine bone	6
Phosphoric acid, insoluble, in fine medium bone	5½
Phosphoric acid, insoluble, in medium bone	5
Phosphoric acid, insoluble, in coarse medium bone	4½
Phosphoric acid, insoluble, in coarse bone	4
Phosphoric acid, insoluble, in fine ground rock phosphate	2
Potash as high grade sulphate	7½
Potash as kainite	4½
Potash as muriate	4½

Corresponding figures for western markets are not yet available.

It should be added that the cost of mixed fertilizers is usually higher than that of the raw materials given above. The difference between the two will represent the manufacturer's expenses in converting the raw materials into the manufactured articles. These expenses include grinding and mixing, bagging or barreling, storage and transportation, commission to agents or dealers, long credit, interest on investment, bad debts, and finally profits.

So soon as possible these trade values will be replaced by others drawn from a review of western markets.

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METEOROLOGICAL OBSERVATIONS.

FURNISHED BY THE WASHBURN OBSERVATORY.

In its annual report for 1883, this Station published a "Summary of meteorological observations taken at Madison during the period 1853–1883," prepared by the Washburn Observatory. By the courtesy of the same institution we are enabled to present in this report a summary of the observations of the year 1884, taken from advance sheets of its volume of "Publications," and also two tables giving summaries by years and by months for the period 1853–1884. These two tables correspond to tables II and III of the Station report for 1883, but have been corrected and brought up to the close of 1884. There is also added a fourth table which was intended to accompany the others, but which was necessarily omitted from our report for 1883 for lack of space.

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TABLE I.—METEOROLOGICAL OBSERVATIONS FOR THE YEAR 1884.

MONTH.	OBSERVATIONS TAKEN AT 7 A. M., 2 P. M., AND 9 P. M. MEANS REFER TO DAY ENDING 12 P. M.			FOR 24 HOURS ENDING 9 P. M.			FOR 24 HOURS ENDING 2 P. M.	
	Mean monthly barometer.	Mean monthly temperature.	Mean relative humidity.	Rain or melted snow.	Highest temperature.	Lowest temperature.	Maximum velocity of the wind.	Total movement of the wind.
	Inches.	°	*Per cent.*	*Inches*	°	°	*Miles.*	*Miles.*
January	29.074	9.2	81.4	1.68	42	—27	36	8,986
February	28.962	16.9	84.0	2.12	37	—13	40	8,247
March	28.968	27.4	77.7	2.31	62	— 9	45	8,083
April	28.930	43.4	69.1	4.51	76	25	45	8,874
May	28.919	57.1	67.3	4.21	78	36	32	7,890
June	29.031	66.6	80.3	5.47	85	47	36	6,131
July	28.907	67.7	73.5	8.44	85	52	78	6,344
August	29.009	66.6	76.7	4.39	85	49	60	7,157
September	28.975	65.1	79.0	4.25	86	47	54	8,412
October	29.063	51.5	78.0	4.60	80	26	54	9,196
November	29.038	33.2	81.5	1.53	60	— 5	32	7,030
December	29.032	16.8	85.3	5.68	43	—20	40	7,633
Sums	.....	.....	.....	49.19	.....	.....	.....	93,983
Means	28.992	43.38	77.8	.....	.....	.....	.....	.....

Highest barometer, 29.583 inches; lowest, 28.244 inches. Highest temperature, 86 degrees; lowest, —27 degrees. Range of barometer, 1.339 inches. Range of thermometer, 113 degrees. Maximum velocity of the wind, 78 miles from northwest. Prevailing winds, south and northwest. Number of clear days, 124; fair days, 149; cloudy days, 93. Number of days on which rain or snow fell, 144. Number of times the wind blew from the north, 134; northeast, 89; east, 48; southeast, 86; south, 277; southwest, 133; west, 119; northwest, 211. (Three observations daily.)

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TABLE II.—SUMMARY OF METEOROLOGICAL OBSERVATIONS FROM 1869 TO 1884, BY YEARS.

N. B.—See remarks at end of the table.

YEAR.	Mean yearly barometer (inches).	Mean yearly temperature.	Highest temperature of the year.	Lowest temperature of the year.	Range of temperature for the year.	Rain or melted snow (inches).	Mean relative humidity. Per cent.	No. days on which rain or snow fell.	Prevailing wind.	Maximum velocity of wind (miles per hour).	Yearly movement of wind (miles.)
1869..	28.966	42.9	89	—11	100	43.27	79.2	103	N. W.	45	.....
1870..	28.920	47.2	98	—13	111	27.83	69.5	93	N. W.	35	.....
1871..	28.903	46.1	91	—15	106	29.51	70.7	103	W.	35	.....
1872..	28.897	44.4	92	—28	120	22.44	73.9	87	S. W. N. W	35	.....
1873..	28.893	43.8	91	—21	112	26.49	76.5	80	N W S. W.	35	.....
1874..	28.950	45.5	96	—15	111	29.02	74.1	85	S. W.	35	.....
1875..	28.917	42.4	86	—25	111	22.59	74.2	100	W. S. W.	25	.....
1876..	28.921	46.1	90	—22	112	36.04	78.3	93	N W. S. W	35	.....
1877..	.....	47.7	88	—16	104	27.67	77.3	84	S. W.	25	.....
1878..	.....	49.7	92	— 9	101	39.54	71.7	104	N W.	50	[23,132]
1879..	28.993	47.9	91	—22	113	35.10	68.7	108	S.	48	87,425
1880..	28.989	48.1	93	—21	114	46.72	70.0	138	S W.	50	90,855
1881..	29.001	46.9	95	—20	115	52.92	72.4	158	N W S	45	84,342
1882..	29.005	47.1	87	—13	100	42.89	75.3	160	N. W W.	48	85,448
1883..	29.006	42.3	89	—23	112	39.84	77.9	121	N. W S.	60	[60,133]
1884..	28.992	43.4	86	—27	113	49.19	77.8	144	S.	78	93,963
Means	28.954	45.7	90.2	—21.0	111.2	35.69	74.2	108	.....	54.1	88,211

REMARKS.—For 1878, the maximum velocity of the wind and the number of miles traveled were observed for October, November, December, only.

For 1883, the same data are for 233 days only; the maximum and minimum thermometer and range of temperature for 323 days. The other data for 323 days.

The mean barometer, temperature, rainfall, humidity, number of days on which snow or rain fell, are given from all the data 1869–1884. The *mean* highest and lowest temperature, the range, and the maximum velocity and the number of miles traveled by the wind, relate only to the year 1879–1884.

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TABLE III—SUMMARY OF THE PRECEDING METEOROLOGICAL OBSERVATIONS BY MONTHS.

MONTH.	Mean monthly barometer (inches). 1853—1884.	Mean monthly temperature. 1853—1884.	Mean maximum temperature. 1879—1884.	Mean minimum temperature. 1879—1884.	Mean monthly range of temperature. 1879—1884.	Mean monthly fall of rain or melted snow (inches) 1853—1884.	Mean relative humidity (per cent). 1855—1884.	Mean number of days on which rain or snow fell. 1853—1884.	Mean direction of wind. 1853—1884.	Mean maximum velocity of wind (miles per hour). 1879—1884.	Mean monthly movement of the wind (miles). 1878—1884.
January.	29.008	18.0	44.0	—15.7	59.7	1.60	81.6	8.6	S. W.	32.7	7,600
February	28.992	21.9	49.2	— 7.0	56.2	1.67	80.9	7.5	N. W.	33.8	7,846
March ..	28.918	30.9	58.5	2.8	55.7	2.05	72.2	8.0	N. W.	38.5	8,375
April ...	28.919	44.5	77.4	18.6	58.8	2.38	66.3	8.4	S W S.	41.2	8,217
May	28.929	58.0	82.3	36.3	46.0	3.76	64.2	10.0	S. N.E	32.8	7,362
June ...	28.915	67.2	86.8	46.2	40.6	4.75	70.2	10.0	S. W.	38.2	6,175
July	28.971	72.4	89.5	53.0	36.5	4.40	68.5	8.2	S. W.	37.8	5,668
August .	28.989	69.8	89.2	50.2	39.0	3.24	69.7	8.3	S.	38.8	5,974
Sept	29.004	61.4	84.2	42.4	41.8	3.40	70.5	8.2	S.	36.3	6,742
October.	28.989	48.6	78.1	27.4	50.7	3.11	71.6	8.3	S.	40.3	7,920
Nov.....	28.967	33.6	61.4	6.9	54.5	2.11	77.4	8.3	N. W.	35.1	8,129
Dec	29.004	22.4	45.6	—11.3	56.9	1.75	80.9	9.4	N. W.	35.6	7,845
Means ..	28.967	45.7	....	.....	49.7	2.85	72.8	8.5	.....	36.8	7,321
Sums ...	.....	....	....	.....	....	34.22	...	103.2	.....	.....	87,853

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TABLE IV.

Excess or deficiency of rainfall and temperature for each month, season and year; with the average yield per acre of the principal crops, 1875 to 1880. Wisconsin and Michigan.

(From Professional Papers of the Signal Service, No 10)

	Average rainfall in inches.	Mean temperature	1875		1876.		1877.		1878.		1879.		1880.		1882.	
			Excess or deficiency of rainfall.	Excess or deficiency of temperature.	Excess or deficiency of rainfall.	Excess or deficiency of temperature.	Excess or deficiency of rainfall.	Excess or deficiency of temperature.	Excess or deficiency of rainfall.	Excess or deficiency of temperature.	Excess or deficiency of rainfall.	Excess or deficiency of temperature.	Excess or deficiency of rainfall.	Excess or deficiency of temperature	Excess or deficiency of rainfall.	Excess or deficiency of temperature.
January	1.65	20.2	−.45	−9.70	+1.05	−4.90	−.50	−3.50	−.09	+6.60	−.97	0	+1.08	+12.08	+.33	+2.30
February	1.65	22.4	−.01	−15.20	+.95	+.80	−2.00	+8.90	−.03	+10.70	+.45	+2.10	+.89	+4.40	+.53	+7.30
March	3.25	28.4	+.17	−5.10	+1.70	−2.40	+60	−2.10	+.18	+13.70	−.84	+2.50	−.90	+.80	+1.61	+2.90
April	2.47	40.8	−.26	−1.00	−.05	+2.50	+.30	+3.40	+1.60	+10.50	−.49	+.10	+1.49	+1.60	+.70	+.30
May	3.56	53.4	+.40	−.80	+1.45	+.60	−2.20	+2.60	−.13	0	−1.43	+1.80	+.8	+6.60	+.80	−5.60
June	4.39	63.6	−.65	−2.40	+1.35	−.40	+.55	−1.40	+.61	−1.40	−.25	0	+1.49	+2.80	+1.39	−2.00
July	3.52	69.1	−.80	−2.10	+.60	+1.00	−.16	+1.10	+.36	−4.40	+1.24	+2.60	+.39	−1.10	.....	.....
August	3.55	67.9	+1.25	−2.50	+.55	+2.30	+.73	+1.50	−.83	+2.90	−.77	−.40	+.39	−.70	.....	.....
September	2.79	59.0	+1.10	−1.60	−.40	−.40	+1.58	+4.20	+1.64	+3.60	+.49	−2.20	−.92	0	.....	.....
October	3.19	47.8	+2.25	−3.50	−.55	−3.20	+3.11	+3.80	+1.30	+3.20	−.69	+9.10	−.72	−1.50	.....	.....
November	2.47	33.0	−.70	−1.70	+.80	+2.30	+2.23	+4.20	−.77	+6.00	+2.50	+.30	−.28	−6.50	.....	.....
December	1.84	23.3	−1.00	+3.00	+.50	+6.70	−.30	−5.70	+.44	+14.70	+.98	+.90	+1.68	−2.70	.....	.....
Winter	5.13	22.0	−1.46	−21.90	+2.50	+12.40	−2.80	−.30	−.58	+32.00	+.46	−1.20	+3.65	+13.90	+.77	+18.70
Spring	9.87	40.9	+.31	−6.90	+3.10	+.70	−1.30	+8.90	+1.65	+24.20	−2.76	+4.40	+1.41	+9.00	+3.11	−2.80
Summer	11.46	66.9	−.20	−7.00	+2.50	+2.90	+1.12	+1.20	+.14	+5.90	+.22	+2.20	+2.27	+1.00	.....	.....
Autumn	9.45	46.6	+2.65	−6.80	−.15	−1.80	+6.92	+12.20	+2.17	+12.80	+2.30	+7.20	+1.93	−8.00	.....	.....
Year	35.91	44.1	+1.30	−42.60	+7.95	+14.70	+3.94	+17.00	+3.38	+74.90	+2.20	+12.60	+5.41	+15.90	.....	.....

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AVERAGE YIELD PER ACRE.

	1875.	1876.	1877.	1878.	1879.	1880.
Corn, bushels	27.0	31.6	23.3	37.4	38.1	36.5
Wheat, bushels.....	13.7	10.2	16.1	15.2	15.8	13.5
Rye, bushels	16.3	13.9	15.5	13.5	14.8	14.2
Oats, bushels.....	37.8	31.1	36.7	37.5	36.9	30.9
Barley, bushels.....	26.8	21.3	25.7	30.7	26.8	25.1
Potatoes, bushels.....	115.8	66.4	87.1	69.1	106.6	104.4
Hay, tons	1.30	1.35	1.31	1.42	1.34	1.27
Cotton, pounds.....	.....	.....	.....	.....	.....	.....
Tobacco, pounds.....	560.0	.....	.....	.....	1,033.0	1,243.0

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ACKNOWLEDGMENTS.

The Station will be glad to receive and place among its exhibits, any article of agricultural interest, making due acknowledgment therefor in its annual report, and such acknowledgment and exhibition will be considered as fully discharging the obligations of the Station to the donors.

In case of articles which appear of sufficient general interest to merit it, appropriate tests will be instituted, provided the other work of the Station will permit, and the results of such tests published for the information of the farmers of the state. In no case, however, will the Station recommend or endorse any such article otherwise than, as above stated, by publishing the results of actual tests.

The following list comprises the articles donated during the year 1884:

From the Eclipse Wind Engine Co., Beloit, Wis.

20 Foot Geared Windmill.

A preliminary report on this mill is given on p. 41.

From Hauck & Comstock, Mechanicsburg, Pa.

Lion Feed Cutter, large size.

A preliminary report on this machine is given on p. 44.

From G. N. Milco, Stockton, California.

One package of Buhach.

A report on this is given on p. 45.

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